JANUARY 18, 1954

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

What Employees Want To Know

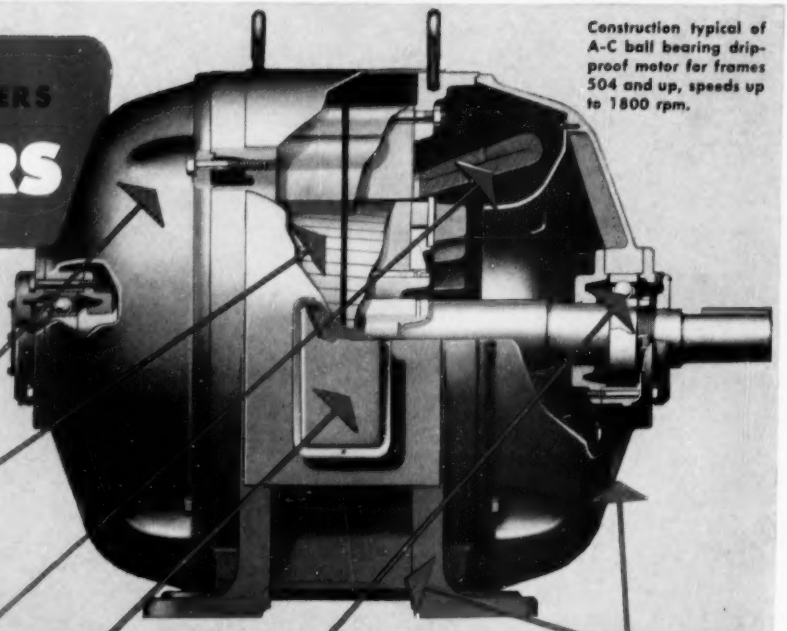
Better communications can boost morale, efficiency—p. 48

✓ NONDESTRUCTIVE TESTS GAIN
New Road to Quality, p. 78

CONTENTS — PAGE 5

ALLIS-CHALMERS

MOTORS



Construction typical of A-C ball bearing drip-proof motor for frames 504 and up, speeds up to 1800 rpm.

All These Features of Good Motor Design

CAST IRON END SHIELDS— assure distortion-free bearing support for maximum bearing life, correct rotor alignment, uniform air gap.

BRAZED CAGE WINDING — copper or copper alloy cage bars are brazed to end ring to produce a practically indestructible rotor winding.

STATOR COILS—multiple-dipped, baked after each dip. Build up tough protection against heat, moisture and corrosive atmosphere.

ROOMY CONDUIT BOX — has ample room for easy connection of leads, may be rotated in 90 degree steps.

CHOICE OF BEARINGS — motors may be obtained with either ball or ring-oiled sleeve bearings. Ball bearings are housing mounted with provisions for in-service lubrication.

EFFICIENT VENTILATION — large intake and discharge openings with ample-sized fan assure a sweeping flow of cooling air. Careful baffling of air flow and plenty of space back of stator core assure adequate, even cooling.

3 Extra Values

1 Nation-Wide Certified Service — Allis-Chalmers Certified Service Shops located throughout the country provide factory-approved parts and service on your Allis-Chalmers motors. A-C Certified Service Shops are independently owned shops that meet the strict A-C standards for modern equipment, experience, and business integrity. They provide you with prompt, economical repair and maintenance.

2 Complete Drive From One Source Allis-Chalmers can supply your complete drive — control — motor — *Texrope* V-belt drive — from one convenient source.

3 Competent Engineering Help Your local Allis-Chalmers District Office representative or Authorized Distributor will be glad to help you select exactly the right motor for your needs. For additional information, write Allis-Chalmers, Milwaukee 1, Wisconsin, for Bulletin 51B6052.

A-4227

Sold . . .
Applied . . .
Serviced . . .

by Allis-Chalmers Authorized Distributors, Certified Service Shops and Sales Offices throughout the country.

CONTROL — Manual, magnetic and combination starters; push button stations and components for complete control systems.

TEXROPE V-belts in all sizes and sections, standard and *Vari-Pitch* sheaves, speed changers.

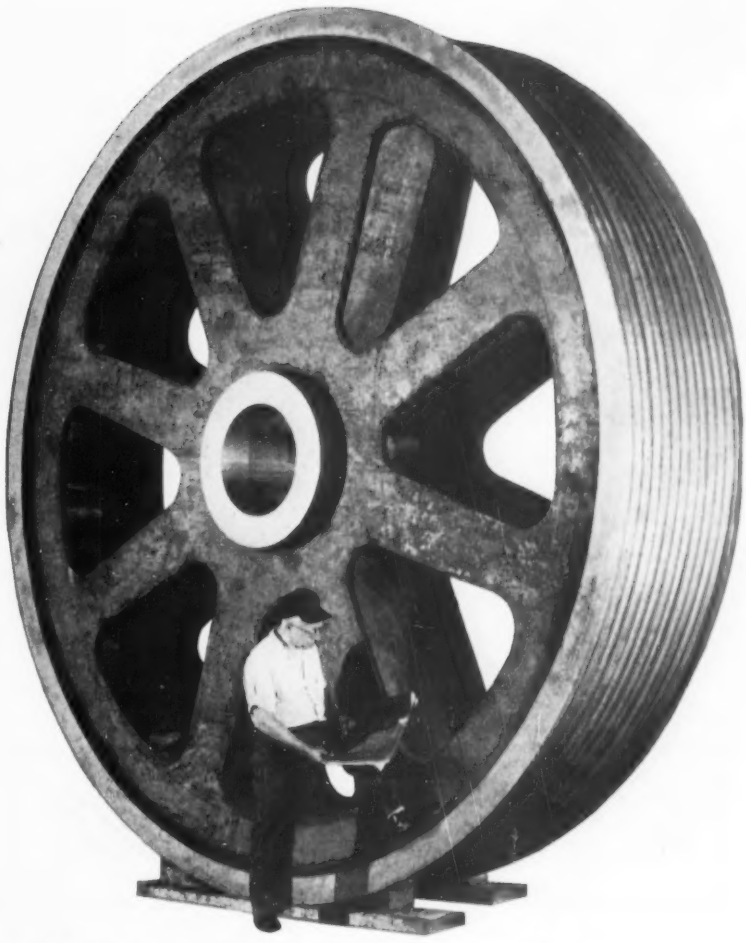
PUMPS — Integral types from ¾ in. to 72 in. discharge and up.

Texrope and *Vari-Pitch* are Allis-Chalmers trademarks.

ALLIS-CHALMERS

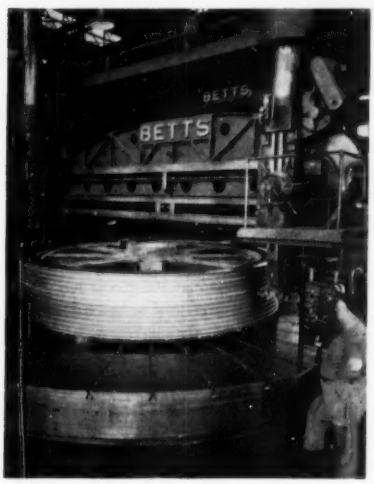
A-C ALLIS-CHALMERS

BIG WHEEL



This 37-ton wheel, a product of our Weldment Shop, is the first of four counterweight sheaves for the new vertical-lift bridge between Queens and Welfare Island, New York. Husky cables, passing over the sheaves, will carry two 515-ton counterweights for raising and lowering the lift span.

Heaviest component of this sheave is the rolled plate rim, 6 in. thick and 3 ft wide. It is made of two plates which were cold-formed into semi-circular shape, then butt-welded together to form a complete circle. Into this ring of steel we securely welded the sturdy web section, with its forged and center-bored hub.



Machining of cable grooves in 25-ft vertical boring mill. Bethlehem is equipped to machine any weldment to your specifications.

After welding, the sheave was heat-treated to relieve possible stresses, then moved to the machine shop for finish-machining and cutting of the cable grooves.

This wheel is a large weldment, but is well within the range our Weldment Shop is used to handling, which includes jobs of all sizes and types; from huge and complex presses, kilns and autoclaves, to smaller and simpler pipe work, vessels and machine parts.

Whatever kind of job you may have in mind, we can probably cut your manufacturing costs by trimming excess weight – without sacrificing strength or rigidity.

You can avoid design limitations with Bethlehem Weldments. We can bend, press, shape and flame-cut the rolled steel plates prior to welding, and incorporate forgings, castings and structural shapes, if required. Any necessary machining operations are ably handled in our well-equipped machine shops.

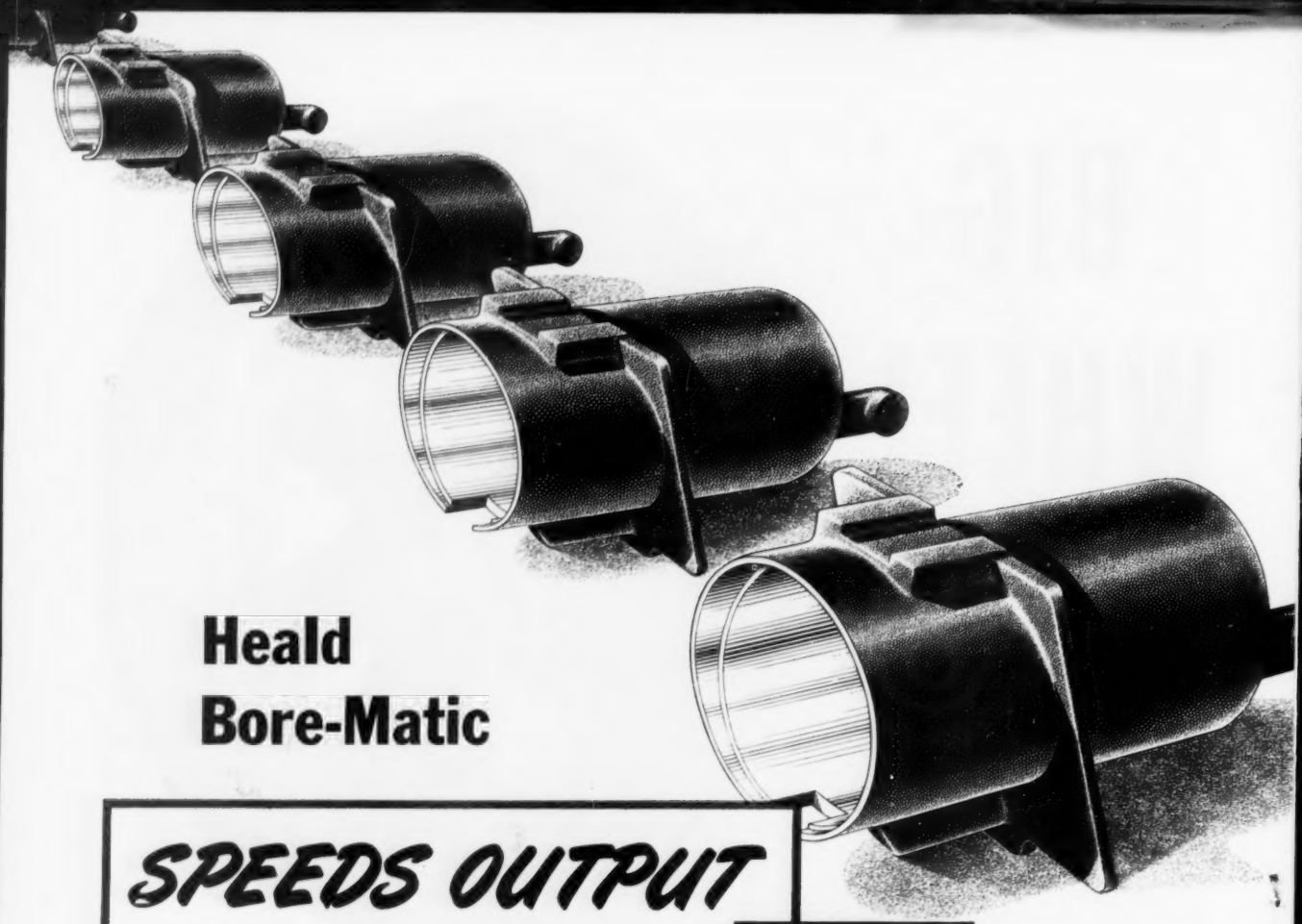
Next time you require a machine part or finished assembly, we suggest that you consider the advantages of Bethlehem Weldments. The nearest Bethlehem office will gladly furnish further information.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM WELDMENTS

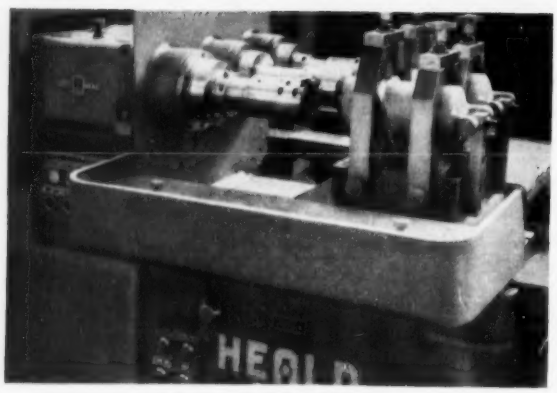
BETHLEHEM STEEL



Heald Bore-Matic

SPEEDS OUTPUT

of ironer cylinders 67%



•WHEN YOU COMBINE high cycle speeds, multiple boringheads and automatic indexing, you'll get faster, better production every time. The Heald Model 321 Bore-Matic shown at the left is a typical example.

By performing both roughing and finishing operations on two parts at a single loading, this machine speeded up the job by 67%. Three boringheads are used — the outer two for roughing the cast iron cylinders, and the center one for the finishing operation. A two station fixture on the cross slide indexes the work automatically. Parts are located in a Vee block fixture, with quick-acting clamps for easy loading and unloading.

Remember — when it comes to precision finishing, it pays to come to Heald.

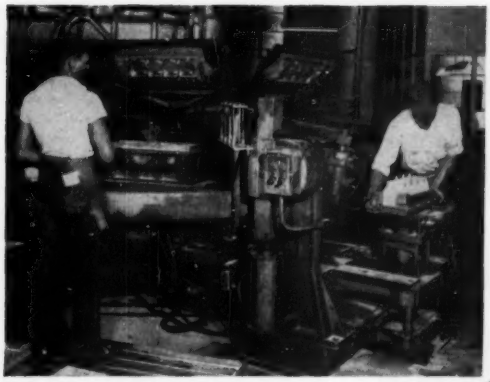
Internal and Rotary Surface Grinding Machines and Bore-Matics

HEALD

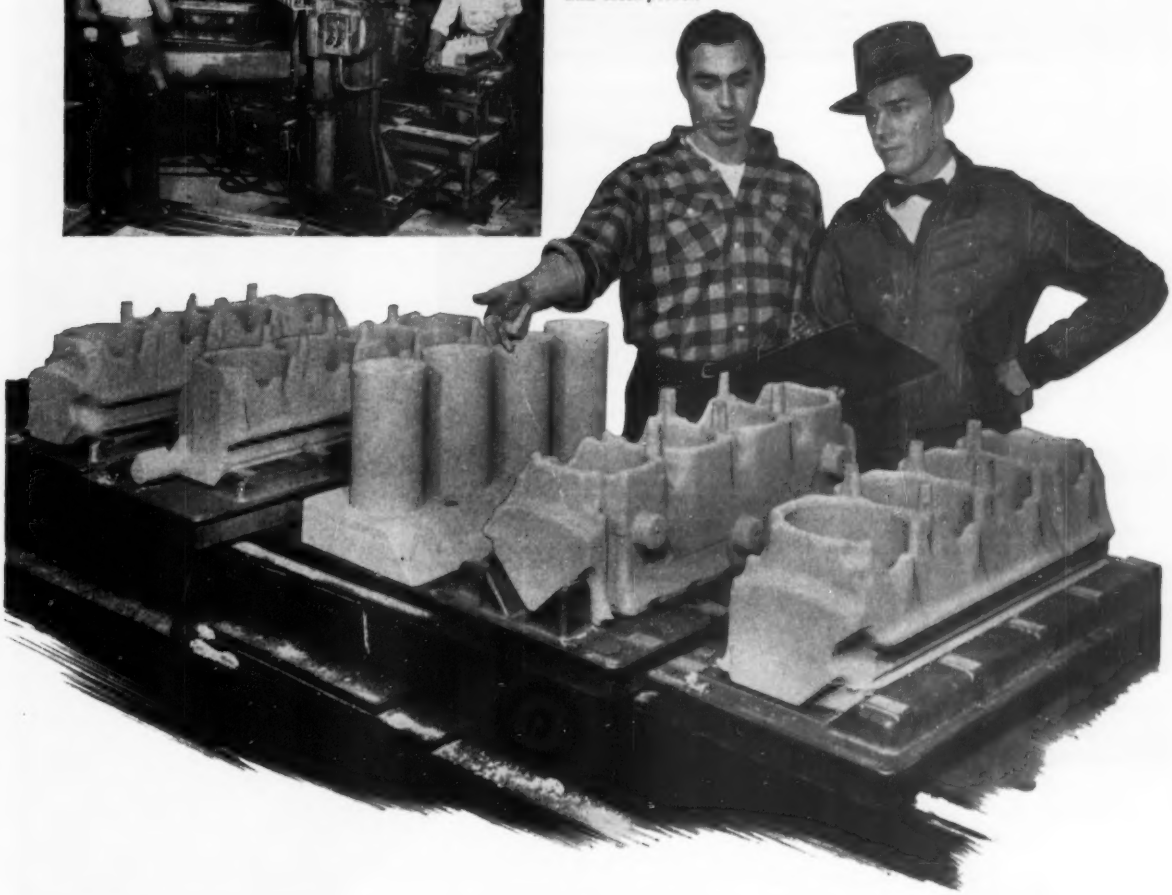
THE HEALD MACHINE COMPANY

WORCESTER 6, MASSACHUSETTS

Offices in Chicago • Cleveland • Dayton • Detroit • Indianapolis • New York



Automatic Production *of 5 different cores at one time with Roto-Core. One operator places dryer over blown core boxes, one operator removes blown core. Third operator sets wires and loose pieces.*



50% more cores per manhour . . . improved quality . . . to cut your foundry costs

HERE, five different cores are being produced at one time. The cores are accurate, uniform in quality. But that's not all; the cores are turned out 50% faster to cut this foundry's molding costs.

With Osborn's Roto-Core Automatic, production of cores is *completely automatic* . . . on a preset, repetitive time cycle. The machine is operated by 2 or 3 men that can be trained in a short time.

Substantial reductions in production cost are not unusual with Osborn's Roto-Core Automatic. These savings can be duplicated in your shop and with your present core box equipment. Your Osborn foundry specialist will gladly survey your core blowing operations and demonstrate how you can benefit right now. Write *The Osborn Manufacturing Company, Dept. EE-14, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

OSBORN

Another example of OSBORN leadership and advanced engineering

MOLDING MACHINES CORE BLOWERS

1. Heavy-duty, impact-cushioning rubber cover specially compounded to resist cutting and abrasion, thickness determined by individual requirements.
2. Special open weave breaker fabric provides better adhesion between carcass and cover and localizes the effects of cutting and chipping encountered on severe operations.
3. Load-carrying carcass of specially woven rubber-impregnated belt duck, constructed to meet specific service requirements. An exclusive Republic treatment protects the duck against mildew.
4. Skim coating of elastic rubber promotes flexibility and guards each ply against penetration of moisture.
5. Flexible bottom cover made of the same wear- and age-resisting rubber as the top cover.

BIGGER PAY LOADS IN THE PICTURE

Here on our screen is what has proven to be the best Conveyor Belt made . . . Republic Rubber Super Excelo! It will carry **more, longer** than any other belt of its type.

If you are now using conveyor belts in an operation just a bit too tough for ordinary belts, it will save you money to try a Super Excelo Belt . . . built by Republic Rubber — for 52 years "Specialists in the production of Industrial Rubber Products."

Your local Republic Rubber Distributor can give you full details on Super Excelo . . . and on any Industrial Rubber Product. If his name is not listed in the yellow pages of your telephone directory, write directly to us.

REPUBLIC RUBBER DIVISION

LEE RUBBER & TIRE CORPORATION, YOUNGSTOWN 1, OHIO

INDUSTRIAL RUBBER PRODUCTS

This Week in Metalworking

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

Vol. 134 No. 3 January 18, 1954

✓NEWS ✓PRODUCTION-ENGINEERING ✓MARKETS

Metalworking Outlook 29
Selected condensed news items reflecting the possible future course of the metalworking world

As the Editor Views the News 33

Windows of Washington 44

Mirrors of Motordom 51

The Business Trend 55
Facts and figures graphically illustrate trends of industrial production

Men of Industry 59

Technical Outlook 77

What's New In Nondestructive Testing 78
A recognized authority brings you up to date on the latest production line equipment and methods

Progress in Steelmaking 82
Rollmaking Art Goes Modern—Here's a seldom-described operation in the steel industry brought to light

Research Views Machinability 88
The other half of the machinability story begun last week is told from the research metallurgists viewpoint

Stud Welding: Fastening Costs Down 30 Per Cent 91
There's no more warpage, locating or cleaning problem at this mass production metal stamping shop

New Products and Equipment 93

Know Your ABC's of Government Specifications 100
As fast as possible, you'll see military specs limited to two series. Here's help in better understanding the jargon

The Market Outlook 107
Metal Prices and Composites begin on Page 108

Nonferrous Metals 110

Behind the Scenes 6
Letters to the Editors 10
Calendar of Meetings 27
Foreign News 47
Obituaries 64
Helpful Literature 95
New Books 103

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There's still a NICKEL SHORTAGE! — BUT

Now you can have bright, attractive, wear-resistant chromium plated finishes *WITHOUT THE USE OF NICKEL*

LUSTER-ON ZINC-CHROME PROCESS*
shows good results on salt spray or humidity tests

LUSTER-ON ZINC-CHROME PROCESS
provides *good wear resistance* — the hardness of chrome plate needed for tools, bumpers, etc.

LUSTER-ON ZINC-CHROME PROCESS
provides *accepted brilliant finish* — for outside wear exposure required for automotive trim, etc.

LUSTER-ON ZINC-CHROME PROCESS
provides *economical operation* — high, rugged quality at lowest possible operating cost

LUSTER-ON ZINC-CHROME PROCESS
provides a *precisely controlled "package" process* — 10 easy-to-follow, easy-to-use steps

Specify

LUSTER-ON ZINC-CHROME PROCESS

FOR CHROMIUM PLATED FINISHES WITHOUT THE USE OF NICKEL

Write for free data sheets and send a part for free processing

*Patent Applied for

THE Chemical CORPORATION
56 Waltham Ave., Springfield 9, Mass.

Control Temperatures

within a

Fraction of a Degree

That's close enough for the most critical control requirements. Actual performance demonstrates that it is being done with a simple electrical unit—automatically. No attention is needed, the operator simply selects the control point on the controller.

A Gordon XACTLINE in the control circuit actuates the control before the set temperature is reached (up or down). The short on-off cycle (as short as three seconds) thus produced will give extremely close control. Because it's electrical—with no dependence on gears, cams, shafts, etc.—it is accurate and reliable.

For Any Heat Process

Gordon XACTLINE can be placed in the control circuit of any fuel-fired or electrically heated oven, furnace, kiln, injection molding machine, etc. Once installed, no adjustment or coordination with the control instrument is required regardless of size of furnace, length of heating cycle, or density of load. It can be used equally well with any existing indicating or recording standard pyrometer controller, regardless of age.

Gordon XACTLINE—a complete, factory-assembled, factory-adjusted instrument enclosed in dustproof case, ready for installation anywhere.

Write for complete details

4528

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Dept. 14 . 2035 Hamilton Ave., Cleveland 14, Ohio

behind the scenes

Another Albany Every 19 Days

We were reading just this morning that the federal government estimates the present United States population at approximately 160,000,000. It is further estimated that the U. S. population, which doubled in the first half of this century, will reach at least 190,000,000 persons by 1975 and well over 200,000,000 by the year 2000.

Our population is zooming upward at the rate of about 300 persons per hour. This means that every 19 days a mythical city about the size of Albany, N. Y., is being created.

The demand for all industrial goods, as you well know, is immediately traced back to people. This tremendous population growth, then, should insure a continued high level of demand for all goods for years to come.

Another interesting facet to this intriguing picture of market growth potential is that in addition to the growing need for more goods to serve more people, there is a continuing demand for more goods per person, and, consequently, a higher standard of living is the result.

About the Livonia Fire

When word of the outbreak of General Motor's historic Livonia fire reached New Jersey Zinc Co. officials, they were urgently in need of a quick and authoritative appraisal of the situation.

Their interest was in the fire's effect on car production as it would affect their diecasting customers. They had to know the extent of the adjustment for which they must prepare—even before the ashes cooled.

To whom did they turn? In the words of an official, "We figured if anybody knew, *you* would!" A hurried call was put through to Floyd Lawrence, STEEL's Detroit editor responsible for the widely read Mirrors of Motordom section. Floyd—who had already been on the scene—gave his appraisal of the devastation.

A few days later when the account came through in STEEL's Mirrors of Motordom section, it corroborated the on-the-spot telephone appraisal and supplied additional information of use to the same officials.

"We figured if anybody knew, *you* would" is a great compliment to the reporting job the editors of STEEL do week after week. The confidence industrial leaders have in STEEL as the source of information on which they base vital decisions is a tribute to consistent authoritative reporting and interpretation of metalworking developments.

It is the result of not only the united effort of the largest editorial staff of any business paper, but also of strategically located resident editors on the scene in Washington, New York, Detroit, Cleveland, Chicago, Pittsburgh and London.

Another example of STEEL's leadership in the rapidly growing industry it serves.

On-the-spot Reporting

During this coming year, 16 different STEEL editors will travel approximately 28,250 miles to review and report on the proceedings of 69 conventions and meetings, each of which is of particular interest to some segment of our readership.

When you glance at this fact through your 3-D glasses and add the third dimension of time, you find that at least 238 man-days, almost 8 full months of time, will be spent by these men in searching out information at these meetings which can be useful to you in your work.

King-Sized Reprint

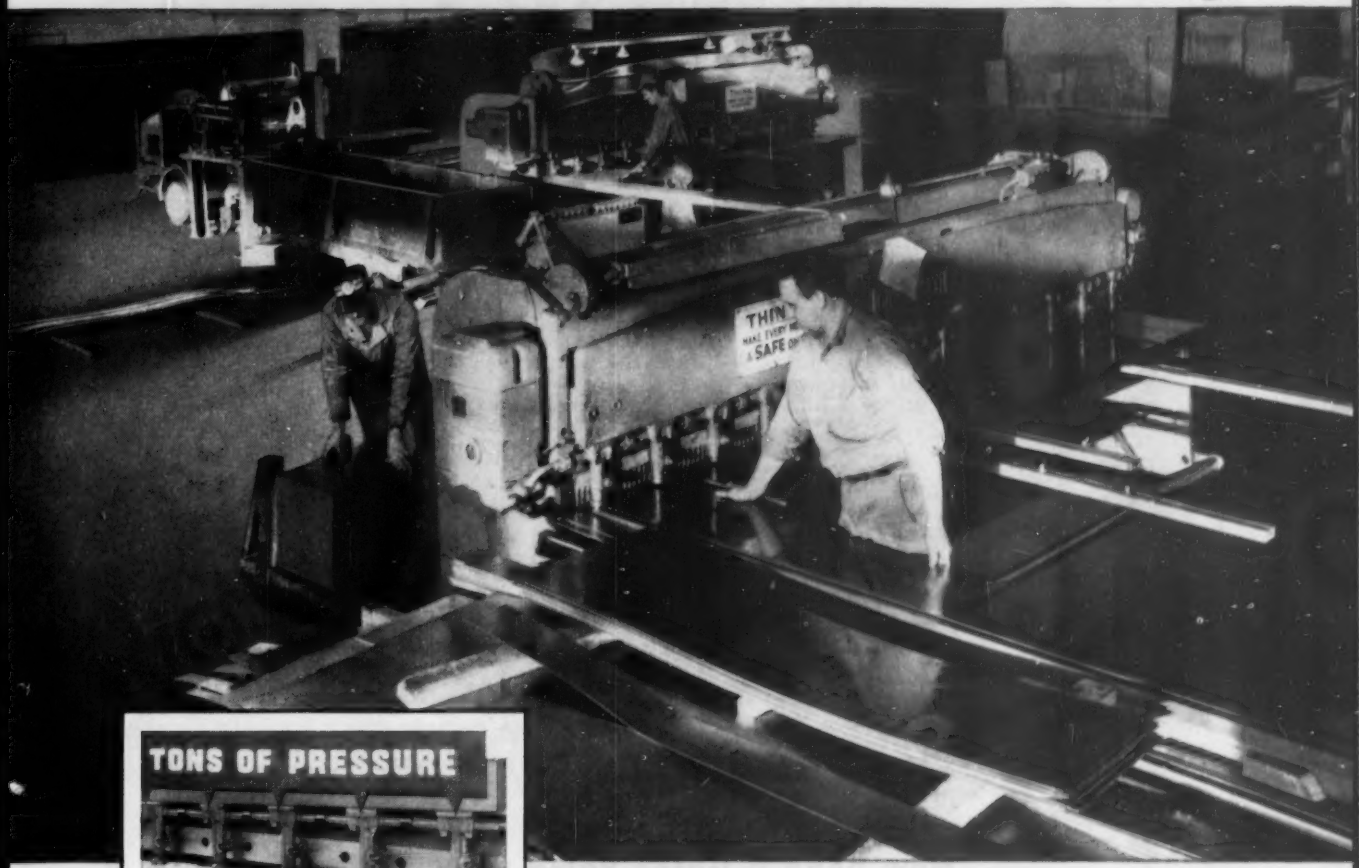
Just yesterday, a copy of the Dec. 31 issue of *The Middletown Journal*, Middletown, O., found its way to our cubby hole. The headline said "Magazine Editor Sees Good Year Ahead for Steel." The article, a full two columns in length, was a word-for-word reprint of Managing Editor Walter J. Campbell's STEEL editorial "Compass for Competition" which appeared in the *Metalworking Yearbook* issue of Jan. 4.

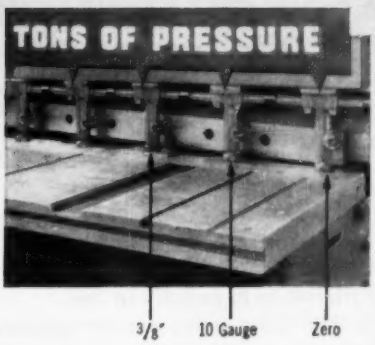
If you haven't yet read it, we suggest you get out your *Yearbook* issue and do so. There's a provocative message here for all metalworking men.

Shrdlu

(Metalworking Outlook—Page 29)

ACCURACY is necessary





Micrometer accuracy starts with Cincinnati Hydraulic Holddowns. They exert tons of pressure and automatically hold all thicknesses of work securely.

...AND THE SPEED AND VERSATILITY OF CINCINNATI SHEARS IS NEEDED, TOO

Here at The W. J. Holliday Company, Inc., The Department Store of Steel—these busy Cincinnati Shears operating continuously, shear accurate blanks to customer size.

They handle cold finished, or pickled and oiled sheets up to 10 gauge and hot rolled sheets up to ¼". Both management and operators are enthusiastic about their Cincinnati Shears.

Write for Shear Catalog S-6.

Photos courtesy The W. J. Holliday Company, Inc., Indianapolis, Indiana

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

CINCINNATI

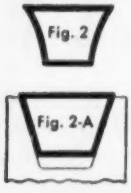
Why V-Belts with CONCAVE SIDES Last Longer!

(U.S. PAT. NO. 1813698)

Prove this yourself!

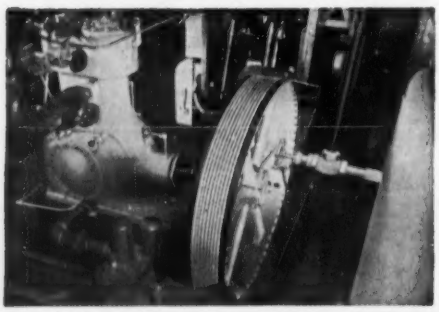
Take any *straight-sided* V-Belt (Fig. 1). Bend it—as it bends in going around a pulley. The sides will at once *bulge out* (Fig. 1-A). Clearly, those bulging sides will press *unevenly* against the V-pulley—and this causes *extra wear* at the points shown by the arrows (Fig. 1-A).

Now bend a Gates Vulco Rope with CONCAVE SIDES (Fig. 2)



Instead of *bulging*, the precisely engineered CONCAVE SIDES merely *fill out* to *fit exactly* in the sheave groove (Fig. 2-A). The sides press *evenly* against the V-pulley. All wear is distributed *uniformly* across the *full width* of the Gates Vulco Rope—and this means *longer* belt life and *lower belt costs* for you!

When you buy V-Belts, be sure to get the V-Belt with the CONCAVE Sides—the Gates Vulco Rope!



Typical Gates Vulco Rope Drive—the Gates V-Belts are built with Concave Sides to insure longer belt wear.

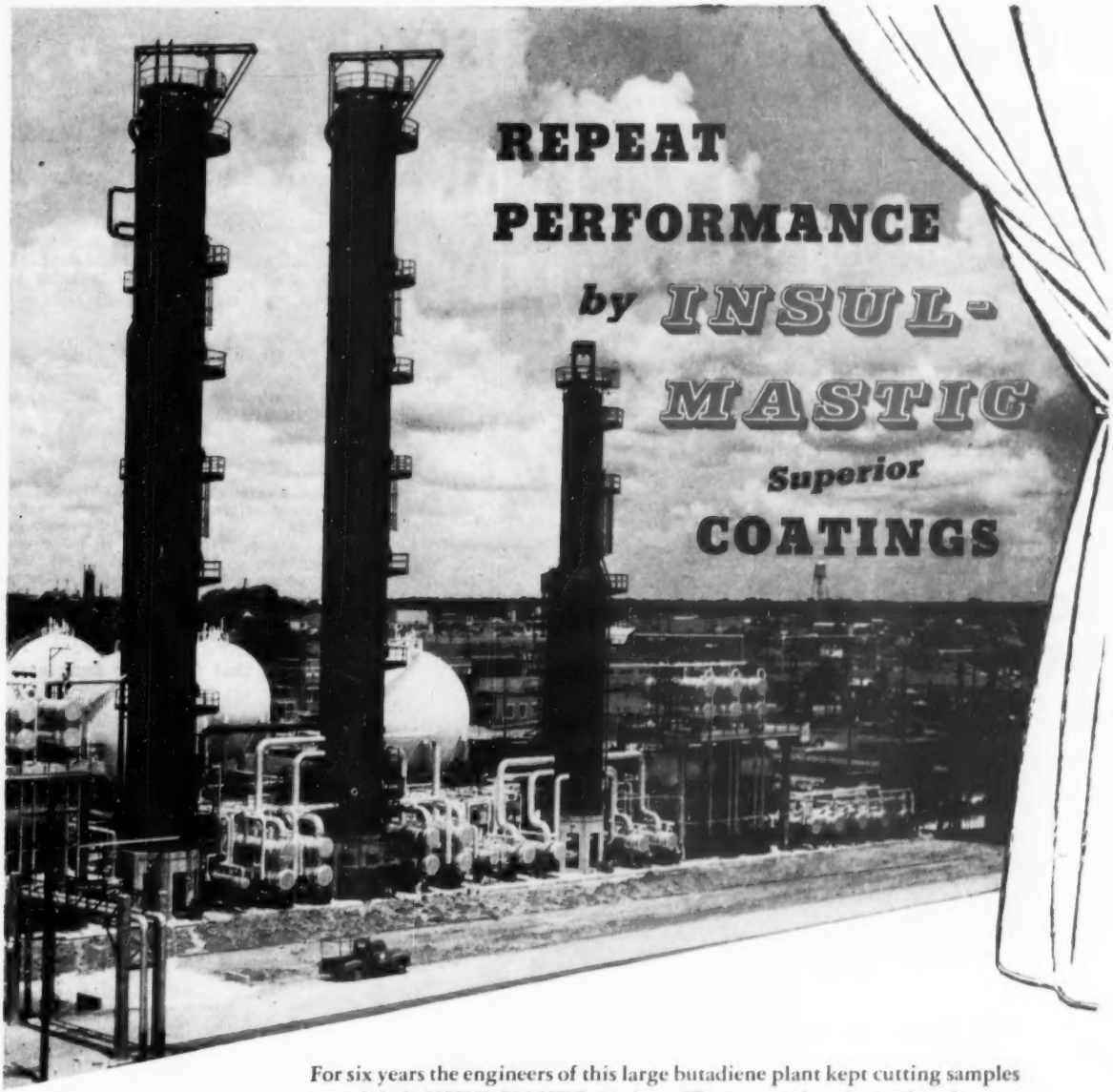
Gates VULCO ROPE DRIVES

REG. U. S. PAT. OFF.

Gates Engineering Offices and Jobber Stocks are located in all industrial centers of the United States and in 71 foreign countries.

THE GATES RUBBER COMPANY
DENVER, U.S.A.

CB-643



For six years the engineers of this large butadiene plant kept cutting samples out of their INSUL-MASTIC coatings. They wanted to determine the condition of the metal or insulation underneath. What they found was so satisfactory that INSUL-MASTIC was specified when the three new towers above were built. It takes excellent results to command a repeat performance from such critics.

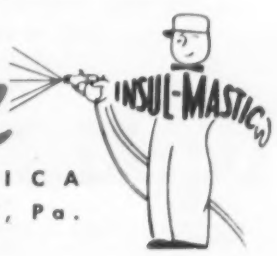
Protect your vessels, Vaporseal your insulation with INSUL-MASTIC coatings. For many long years they will halt weather, acids, alkalis, moisture vapor and other causes of corrosion.

What INSUL-MASTIC has done in the plant above has been repeated in hundreds of plants. Specify *proven* protection. Specify INSUL-MASTIC *Superior* coatings.

Use INSUL-MASTIC Type "D" for insulation and corrosion up to 250°F. Our technical engineers are available to help you with this and other coating specifications.

Think *first* of the coatings that *last!*

Insul-Mastic



CORPORATION OF AMERICA

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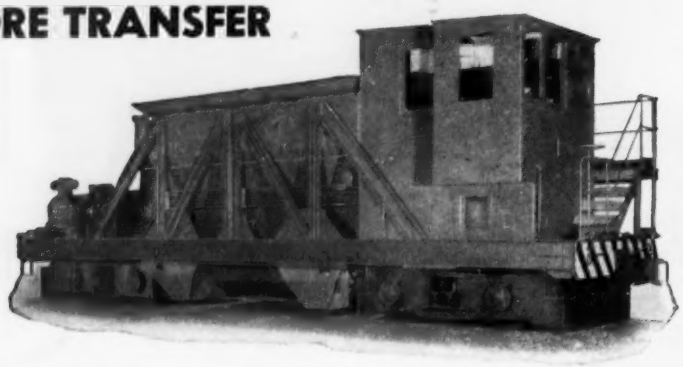
DEPENDABILITY TO SATISFY

RECORD DEMANDS

ATLAS CARS

Atlas Cars for steel plants are known to have that extra work factor which is so important in these days of high production.

50-TON BOTTOM DUMP ORE TRANSFER



This 50-ton ore transfer is a modern air-operated car with a heavy slab truck to protect motors and brakes when plowing through ore piles. For added safety a folding car pusher arm is used and is provided with a safety latch which cannot be lowered unless the switchman holds the latch. The overhung cab allows a clean line of vision for the operator.

Special features include electric hopper heaters, centralized lubricating, roller journal bearings, air brakes and, of course, all necessary safety features.

Custom Builder of Steel Plant Cars

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

LETTERS
TO THE EDITORS

Turned Phrases Turn Reader

After reading Floyd Lawrence's "Mirrors of Motordom" in the Nov. 30 issue (p. 69), I must say that I was not at all impressed with Mr. Lawrence's attempt to use clever phrases such as:

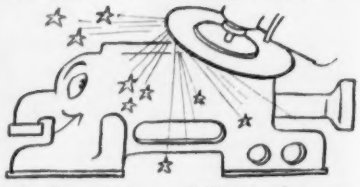
"Interesting stuff"
"Goof-resistance"
"Poop-sheeted"
"Merry-go-round type gismo"

Frankly, I do not feel that these are at all in place in an otherwise excellent magazine such as STEEL.

Robert A. Wallace, P.E., M.E.
The Knoll
Venetia, Pa.

• *We appreciate your comment on Floyd Lawrence's use of coined words in "Mirrors of Motordom." Some people feel just as you do about it; others say they like it. Frank expressions such as yours are of inestimable value to editors in gaging the reception by the readers. We thank you for this expression.—ED.*

Smooth Out Grinding Problems



In Nov. 2 issue of STEEL, there appeared the article, "Smooth Out Your Disc Grinding Problems" by J. Karl McLaughlin, Behr-Manning Corp. (p. 92). I would appreciate two sets of tear sheets of that article.

J. Q. Adams
General Manufacturing Services
International General Electric Co.
Schenectady, N. Y.

Please send the writer one set of tear sheets . . .

M. E. Lillie
Linde Air Products Co.
Tonawanda, N. Y.

• *Sent.—ED.*

Quick Response to Yearbook

I wonder whether I could obtain your very interesting section, "1954 Metalworking Facts and Figures" (Metalworking Yearbook issue, Jan. 4, pp. 157 to 204). I will be very happy to receive two copies if that is possible.

H. Kern
American Saar Steel Corp.
New York

Please forward as soon as possible six additional copies of your 1954 Metalworking Yearbook issue of STEEL.

Hal W. Francke
Kearney & Trecker Corp.
Milwaukee

Will you kindly place our order for four additional copies of this issue to be sent directly to me . . .

E. F. Brissie
division manager of public relations
Doehler-Jarvis Division
National Lead Co.
Toledo, O.

Please turn to p. 12

NOW— NEMA Type XII

THE ONLY SAFETY SWITCH IN SPECIAL INDUSTRY ENCLOSURE!

CAPTIVE SCREWS assure tight cover fit

EXTERNAL MOUNTING FEET eliminate need for conventional leaky mounting holes within the enclosure

NEOPRENE GASKET provides positive cover seal

WELDED TIGHT ENCLOSURE without knockouts excludes dirt, dust, oil, and splashing coolant

This new heavy duty switch, built to NEMA XII specifications, is "tailor-made" for applications requiring the exclusion of dirt, dust, oil and coolant.

The rugged, visible-blade switch mechanism within the special industry enclosure has all the performance features that have made Square D an overwhelming "first choice" for fifty years.

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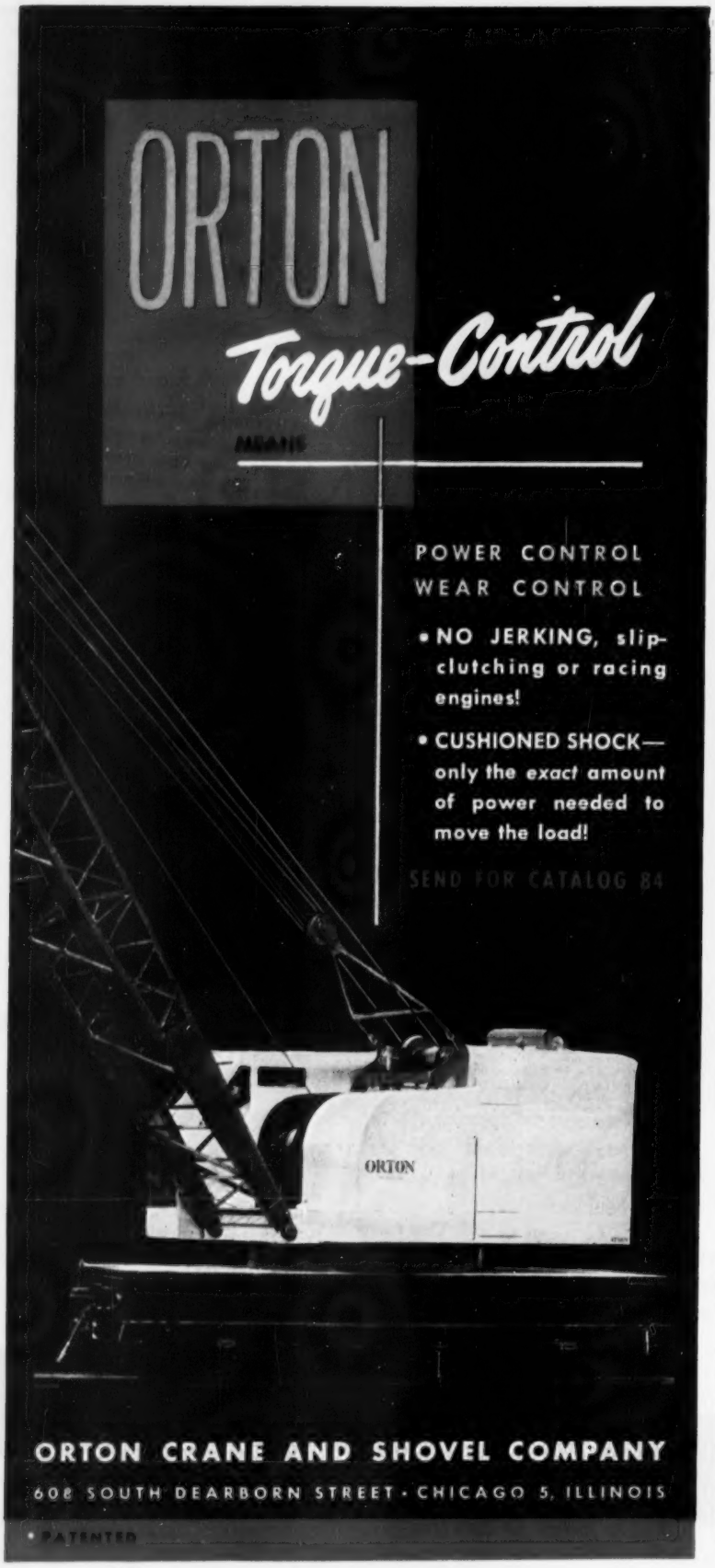
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LETTERS

Concluded from p. 10

I would like to receive a copy of the 1954 Metalworking Yearbook issue of STEEL for my personal files . . .

Hugh S. Hughes
assistant production engineer
McKay Co.
York, Pa.

. . . we would appreciate receiving two extra copies.

R. O. Berg
vice president, charge of research
Michigan Steel Tube Products Co.
Detroit

• *These requests have all been filled.—ED.*

Invitation to Indexes

It is noted in your magazine that you have an editorial index which is available semiannually. Would you kindly send me your latest index and also inform me as to whether older indexes are available.

D. A. Tyree
Research & Development Department
Firth Sterling Inc.
Pittsburgh

• *Sent is the index for volume 132 (January, 1953, through June, 1953). We are placing your name on our mailing list and you will receive the index for volume 133 (June, 1953, through December, 1953) as soon as it is available, probably within a month. We have a limited supply of most of the back indexes which we will be glad to forward upon request.—ED.*

Machine Tool Guide Tops

We have received Section II of your Nov. 16 issue, "Machine Tool Buyers' Guide," and we feel it is an excellent publication. We would very much appreciate six more copies for reference use by various departments in our organization.

M. Shapiro
Waterbury Tool
Division of Vickers Inc.
Waterbury, Conn.

Your "Machine Tool Buyers' Guide" is considered one of our most valuable buying aids. Because of this popularity and consequent scarcity, I would like to have a copy for my own use in methods engineering.

Gordon Jungbluth
10333 Grange Ave.
Hales Corners, Wis.

Will you please send us 12 copies . . .

Charles L. Haynes
vice president
Harron, Rickard & McCone Co.
of Southern California
Los Angeles

We would like three copies . . . we have already received one copy along with our subscription for M. Robert Niman, president of this company, and believe it helpful enough to show to other members of this firm.

J. Moss
National Foundry Co. of New York Inc.
Brooklyn, N. Y.

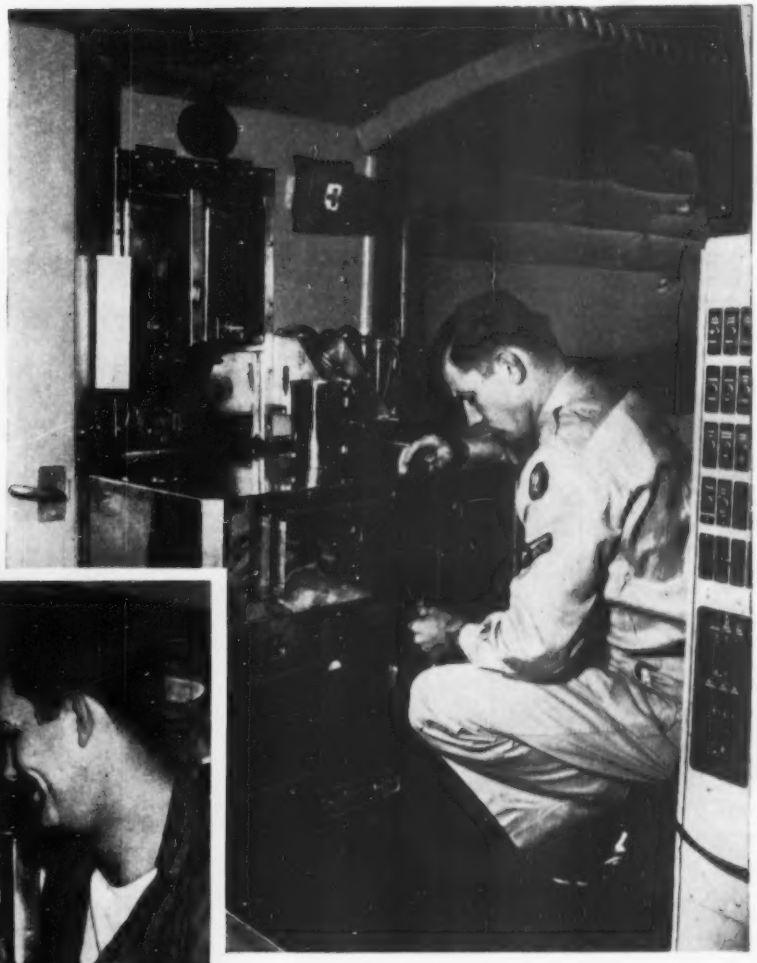
• *These requests have all been filled.—ED.*

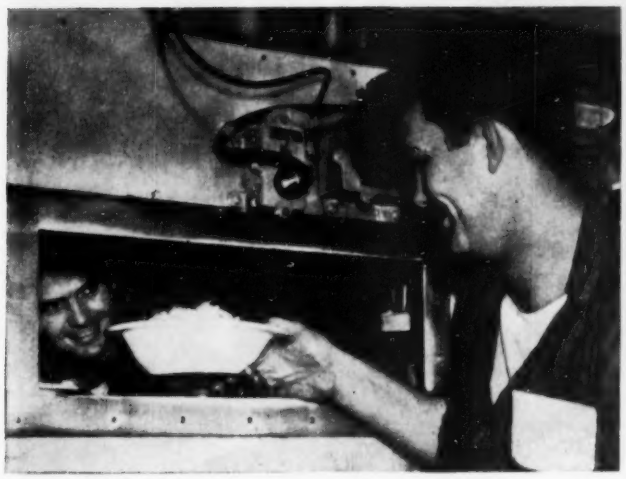
Sky-High

or

Fathoms

Deep





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Food is

Concerned

From airplanes to subs and all points between, stainless steel is the one metal most associated with the preparing and serving of food. Why? Because it's the one metal that best combines *all* the desired virtues: beauty, strength, hardness, cleanliness, long life, low maintenance, easy fabrication, and high resistance to corrosion and heat. ● Now those are qualities to conjure with! Where can *you* use them? Where can you employ Allegheny Metal to improve your product or reduce costs in your equipment—and how can we help you? *Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa.*

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If it's your job to buy nuts, and be concerned about delivery, you'll be glad to know that all four RB&W plants across the country are now manufacturing and stocking the famous RB&W nuts in large quantities.

No matter where you're located — on the booming West Coast, in the industrial Midwest or along the busy Atlantic seaboard — you're only a phone call away from fast, dependable delivery of the fasteners with the 109-year record of dependability.

For generations RB&W, recognized as the largest manufacturer of nuts, has pioneered in the development and manufacture of cold-formed nuts. Since 1946, RB&W has invested millions of dollars in new machinery to turn out high-quality fasteners — more than three million has been spent on nut-making facilities alone. This equipment, plus the unmatched craftsmanship of four generations of RB&W men and women, explains why RB&W continues to lead the field in the production of top-quality nuts.

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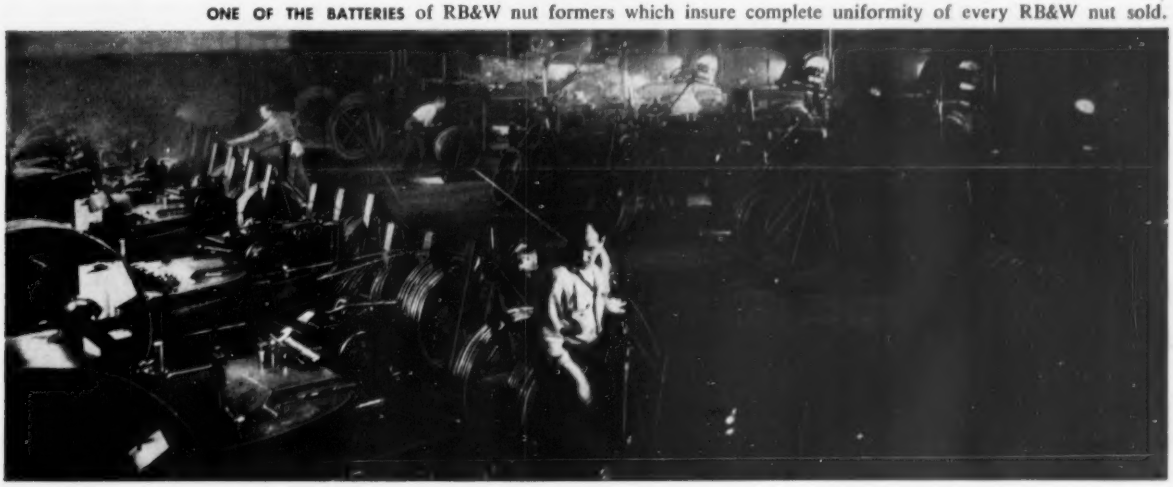

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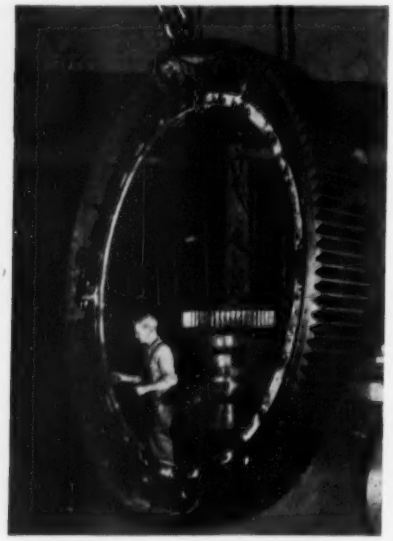

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Production Pointers from GISHOLT

GISHOLT TIME-SAVING IDEAS

Presented as a service to production men, we hope some of these interesting ideas, chosen from thousands of jobs, will suggest ways to help you cut time and costs in your own work.

FOUND: A FAR BETTER SURFACE FINISH FOR VITAL TRANSMISSION PARTS

Superfinish Does the Job in One High-Speed, Automatic Operation

The demand for automatic transmissions in today's automobiles poses new problems in the machining and surface finishing of vital parts. Take this sun gear shaft: four separate bearing surfaces require ultra-fine finish to assure maximum life.

Superfinish proved to be the solution. A standard Model 51-A Superfinisher was modified for the job. Four quills, each with its own stoneholder and stones, were added along with a special workholder and driver.

MEETS ALL 3 REQUIREMENTS

Accuracy: All four surfaces are done at once—Superfinished down to 5 micro-inches from a 15 micro-inch grind. With the automatic cycle, there is precisely the same stock removal and surface finish time after time.

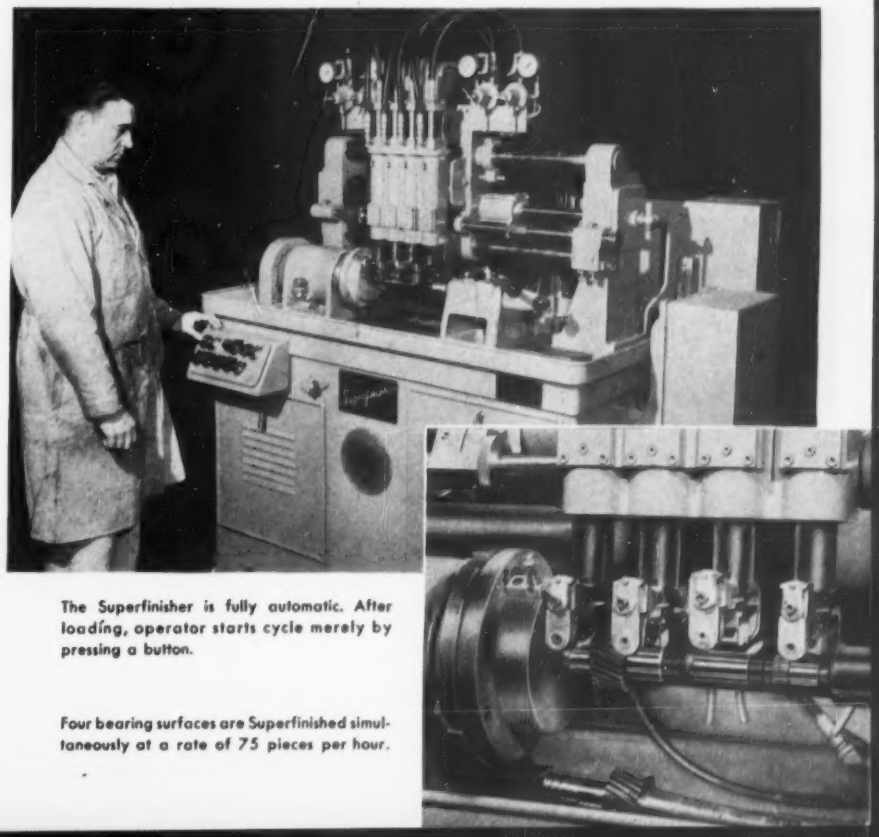
Superfinish rids the bearing surfaces of all annealed "smear metal" and grinding flats. Surfaces are true base metal, assuring absolute maximum bearing life.

High-Speed Output: The single Superfinisher produces 75 completed shafts per hour at 85% efficiency.

Low Costs: With the low machine investment and the fast automatic operation of the Superfinisher, production costs are very low. Because Superfinishing takes the place of a final grinding operation, costs are actually lower—yet surface finish is far better and longer lasting.

Here, with both low machine investment and low production costs, vital transmission parts get far better, smoother, longer lasting surfaces.

FACTS ON TWENTY JOBS—with photos and complete information are given in this brand-new Superfinish Catalog, just printed. The many typical applications will show how Superfinish can help you—in achieving better quality surface at low costs. Write for your copy today.



The Superfinisher is fully automatic. After loading, operator starts cycle merely by pressing a button.

Four bearing surfaces are Superfinished simultaneously at a rate of 75 pieces per hour.

GISHOLT

TIME-SAVING IDEAS

WORKING ALL ANGLES TO CUT COSTS ON DRILL BIT BLANKS

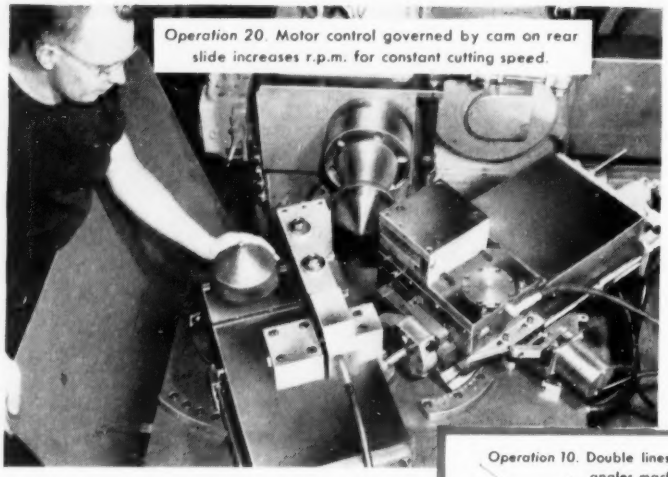
No. 12 Hydraulic Lathes Adjust Quickly for Many Different Parts and Angles

The question to be answered by this producer was how to most efficiently machine similar parts having dissimilar angles . . . and get easy changeover to other sizes. The workpieces are hard steel cone blanks; the finished products are oil well drill bits.

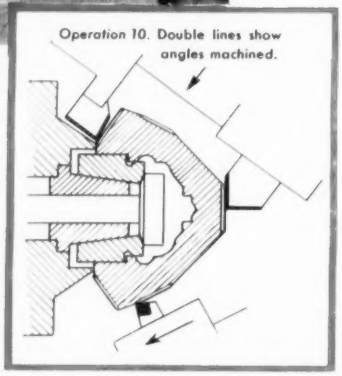
Because of the variety of sizes involved with each type having multiple angles, the practical solution was a pair of No. 12 Hydraulic Automatic Lathes. These are operated by one man. Changeover is simple with tool slides mounted on swivel bases.

A typical setup for operation 10 is shown in the tooling layout. Both front and rear slides can be adjusted to the required angles. The work on this 6½" cone takes less than a minute and a half, f.t.f.

Operation 20 is shown in the photo. Again the front and rear slides are mounted on swivel bases. The rear slide turns the long cone, and a special motor control speeds up the spindle to give a nearly constant cutting speed as the tool approaches the cone point. A fine finish and excellent tool life is the result. The front slide turns in the conventional manner. Floor-to-floor time is just over a minute.



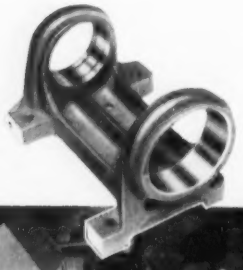
Operation 20. Motor control governed by cam on rear slide increases r.p.m. for constant cutting speed.

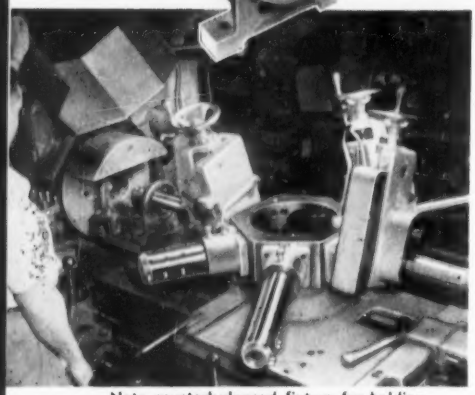


Operation 10. Double lines show angles machined.

Having slides that pivot is a big time saver in changeover of the No. 12 Hydraulic Automatic Lathes to other parts with different angles.

HOW THIS AWKWARD PART IS MACHINED WITH EASE





Note counterbalanced fixture for holding awkward part.

Unusual Job Efficiently Handled on Turret Lathe

How to handle this awkward, unbalanced part on a general-purpose turret lathe? Good planning and a 2L Saddle Type Turret Lathe provided the solution.

A special angle plate fixture with locating feet was built to hold the long rotor shaft housing. This eliminates chucking strain and insures that both bores will be round, concentric and in line. The counterweighted fixture is dynamically balanced with the workpiece to permit the high spindle speeds required for volume output and proper finish.

Tools are simple. Vertical slide tools handle all recessing, and boring bars take care of the two diameters. Time is 8.6 minutes floor-to-floor. Changeover for other size housings is simple.

★ ★ ★ ★ ★ ★ ★ ★

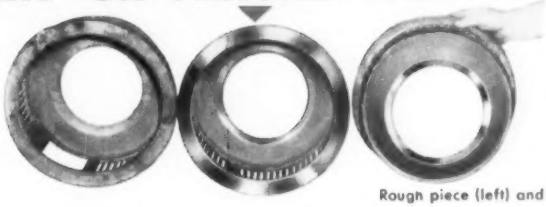
Doing boring and recessing on this clumsy part is a simple operation on the saddle type lathe with special holding fixture.

GISHOLT

TIME-SAVING IDEAS

GETTING A FIRM GRIP ON FRAGILE PART

Fastermatic Sets Fast Pace on Light Frame



Rough piece (left) and finished parts.

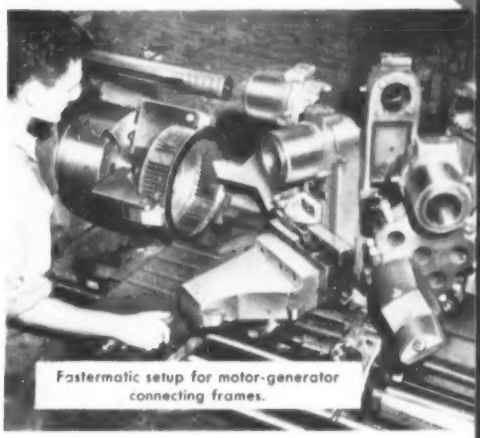
Thin-wall parts are usually a problem. But, in this case, the job is doubly tough because the workpiece is a welded assembly and has an open frame. Bores must be concentric and the faces parallel.

Devising a holding fixture was a routine matter, with Gisholt's long experience as a builder of lathes and chucks providing a "stock answer." A standard 15" 3-jaw air chuck assures speedy operation and controlled chucking pressure. Extended jaws permit pressure to be applied by rocker-type jaw ends on the front and back rings. This centers the workpiece and equalizes pressure at all points, avoiding distortion.

A 2F Fastermatic Automatic Turret Lathe handles the job. To avoid possible distortion from excessive stock removal, rough and finish cuts are made on both bores and faces. Special long tool holders carry tool bits for simultaneously machining the front and back surfaces.

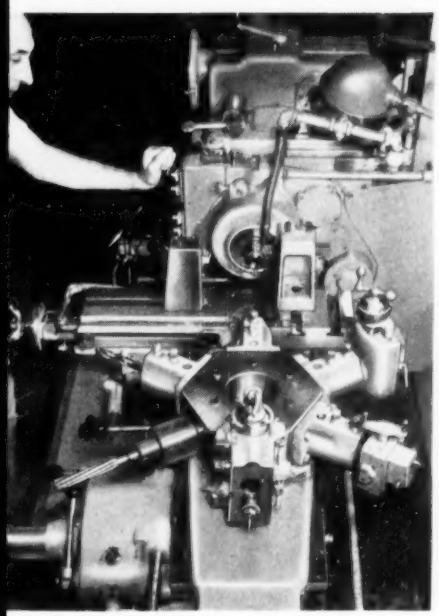
The job is completed in the excellent time of only 5.5 minutes—with the automatic cycle of the Fastermatic enabling the operator to run other machines.

Fragile parts are quickly produced with repetitive accuracy, thanks to well-planned chucking and the automatic cycle of the Fastermatic.



Fastermatic setup for motor-generator connecting frames.

BUSINESS-LIKE SETUP FOR MACHINING BUSHINGS ON TURRET LATHE



Setup for efficient machining of stainless steel bushings.

Ram Type Machine Has Standard Hydraulically Actuated Collet Chuck and Bar Feed

Here's a fast, simple, low-cost way for machining 1¼" ring seal bushings. The job is done in a single operation on a No. 4 Ram Type Turret Lathe.

To start, the stainless steel bar stock is advanced through the spindle and held in the collet chuck. Both movement and clamping are hydraulically actuated—saving both time and effort.

The first station on the hexagon turret is a stock stop. The next two stations are used for conventional drilling and reaming. A vertical slide tool, seen in the foreground of the photo, carries a hook cutter and catches the first recess in the bore. The turning of the straight OD from the cross slide is then combined with the five-degree chamfer from the hexagon turret. The second recess in the bore is formed from the sixth station. Cut-off tool at rear of cross slide completes the operation.

Well-planned tooling with the advance and clamping of bar stock hydraulically controlled saves time and effort on this Ram Type Turret Lathe job.

GISHOLT

TIME-SAVING IDEAS

MASSIVE FLYWHEELS BALANCED FOR SMOOTH OPERATION

Direct Readings Show Unbalance Correction Required

The huge part you see here is a non-magnetic inertia flywheel for Navy Minesweepers. The problem is to make them smooth and quiet in operation. This means precision balancing which is readily done on a Gisholt DYNETRIC Floor Type Balancing Machine.

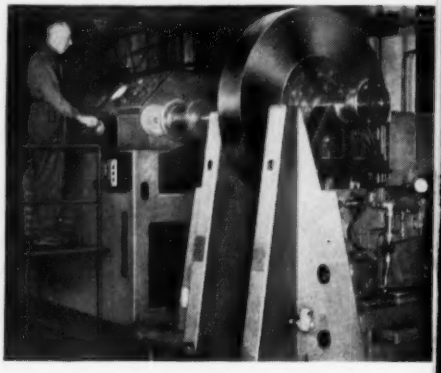
The flywheel assemblies weigh 5,200 lb. and measure 50" in diameter. Although the dynamic correction planes are only 9½" apart, the flywheels are easily balanced to less than 1 ounce inch in each plane. Correction for unbalance is made by grinding on the outer rim.

The flywheel is balanced on its own shafts and supported on its own bearings. Heavy oil pressure to the half bearings eliminates metal to metal contact and protects the arbor journals. Other rotating parts of the engines are also balanced to fine tolerances, assuring quiet, smooth operation of the final assembly.

Whether your problem is balancing large parts like these . . . or components weighing only ounces, there is the right Gisholt Balancer for the job.

"Floating" these heavy parts on pressurized half bearings not only protects the bearing journals, but facilitates precision balancing as well.

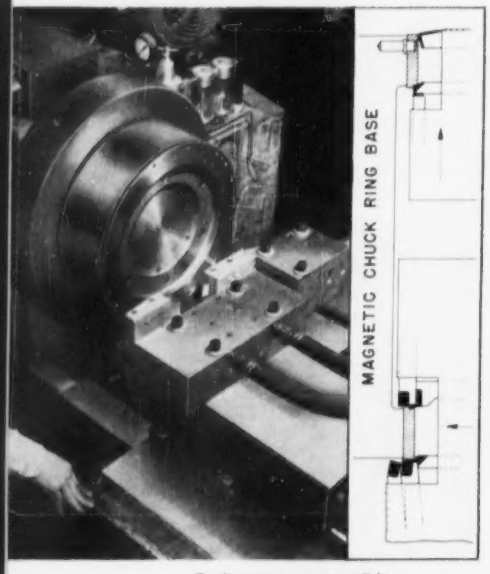
DYNETRIC BALANCERS — GISHOLT



PRODUCTION BALANCING . . .

is only one of the many helpful subjects covered in the Gisholt Balancing School —only service of its kind available to industry. Ask for details.

HOW TO HOLD CRITICAL DIAMETERS ON LARGE, THIN PARTS



Tooling setup on two slides.

Standard Simplimatic with Special Chucking is the Answer

The workpiece is a flywheel cover plate. It's a difficult part, both to hold and machine.

Here's how the job is done:

Because of the thin-wall and wide diameter of the workpiece, a magnetic chuck with a ring base and locating pins is used. With the slightly smaller size of the base, the turning and boring tools have clearance to pass through the work.

For concentricity of the OD and ID, they are machined simultaneously —rough, finish and chamfer the OD; bore and counterbore the ID. Five tools mounted in a single tool block on the front slide handle this work while three tools on the rear slide move across to face, chamfer and groove the ID.

Time is an even 3 minutes floor-to-floor, showing the efficient setups you can have with the Simplimatic Automatic Lathe.

Smart chucking and simultaneous machining of the ID and OD aid greatly in achieving speed and accuracy on these delicate parts.

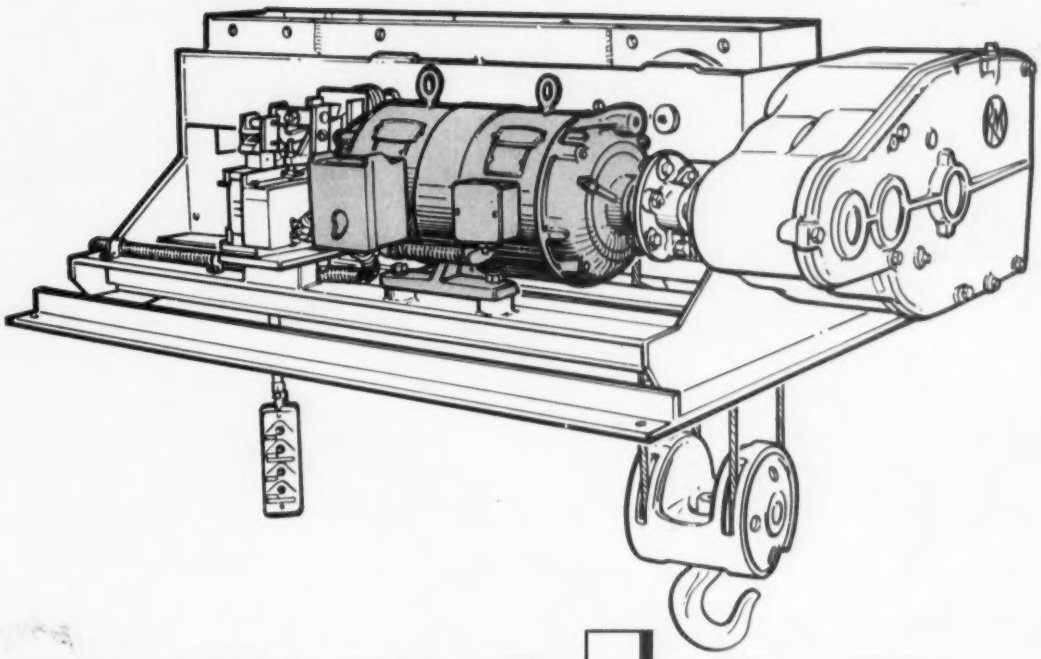
Many interesting jobs and tooling illustrations are shown in the helpful Simplimatic catalog. Ask for Bulletin 1159.

No. 1-254
615

THE GISHOLT ROUND TABLE represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

GISHOLT MACHINE COMPANY Madison 10, Wisconsin

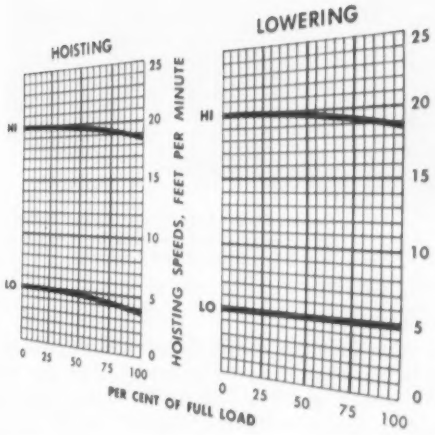
TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES



muscles

ALWAYS UNDER ABSOLUTE CONTROL

You get positive load handling from zero to rated capacity in either speed with Robbins & Myers "Dual-Duty" (two speed) hoists. Twin muscles—one fast, one slow—are embodied in the simple, trouble-free polyphase squirrel cage R&M hoist motors—linked together in a common housing. Three to one, or four to one speed ratios provide fast lift or lower, with slow gentle speed for accurate spotting. Two motors—the extra safety factor that prevents line shutdowns. If one motor should fail, the other would finish the job. And it can too! The graphs tell the story—less than 14% speed variation when handling rated load in low speed! Conventional multi-speed hoists can't touch that record. *Load Capacity:* 1,000 to 20,000 lbs.; *Speeds, low:* 2½ to 13½ f.p.m.; *high:* 10 to 54 f.p.m.; *Controls:* 2 or 4 pushbutton (4 is standard); *Mounting:* Lug or hook—plain, geared or motorized trolleys.



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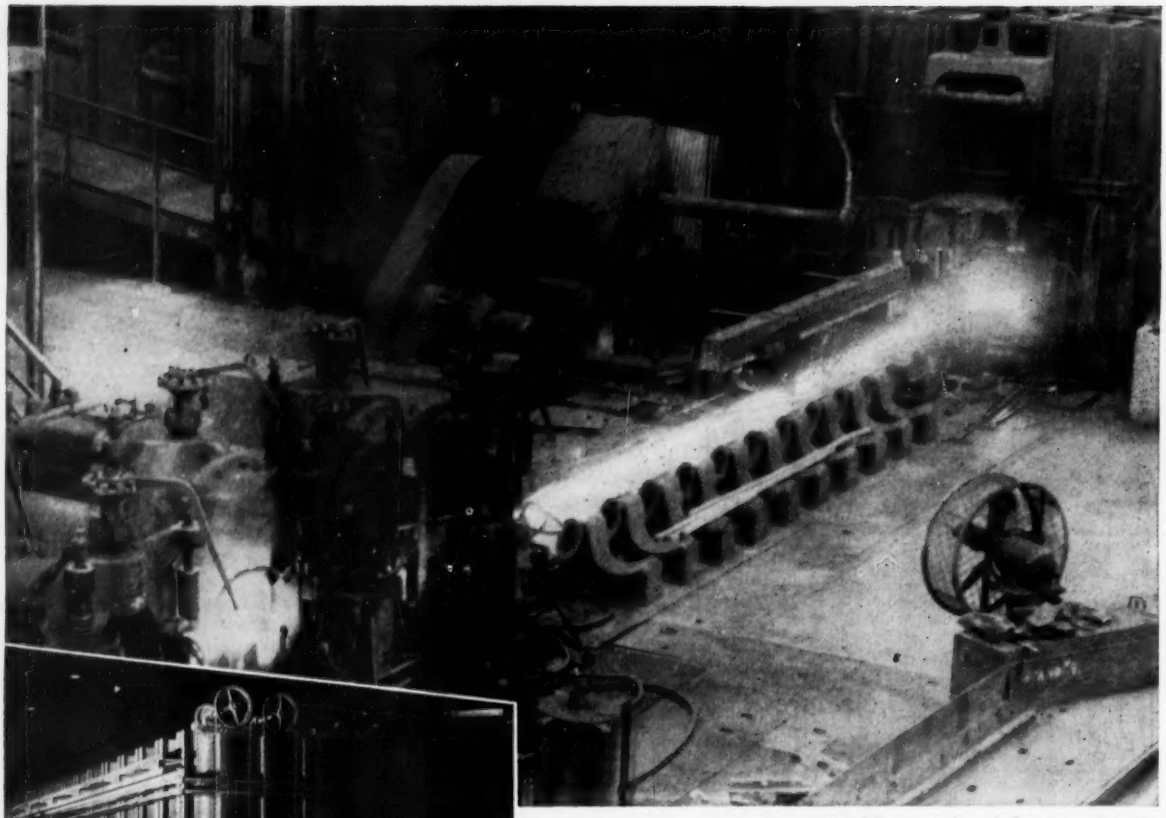
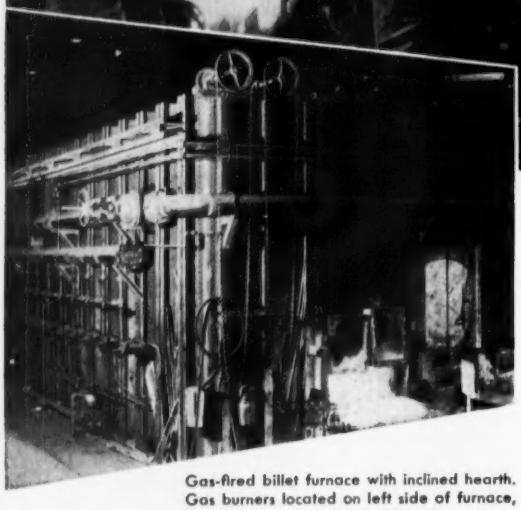


Hot billet goes through first pass after discharge from Gas-fired billet heating furnace.



Gas-fired billet furnace with inclined hearth. Gas burners located on left side of furnace, heat billets at lower end of hearth.

GAS provides the accurate temperature control for precision heat processing at Sheffield Steel Corporation

No other industry conducts more heat processing operations than the steel industry, and the use of GAS in the many reheating furnaces and heat treating operations at the Sheffield Steel Corporation has contributed to lower production costs plus higher efficiency in their plants.

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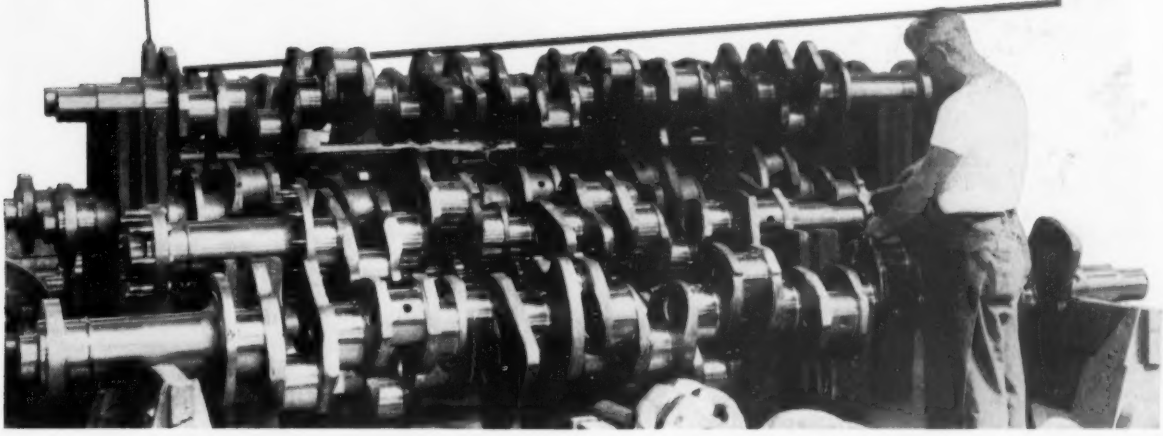

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For the complete story on Chateaugay, the low phosphorus, copper-free Pig Iron, call in a Republic Pig Iron Metallurgist. There is no obligation for his services.

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Mill Roll Manufacturer Reports

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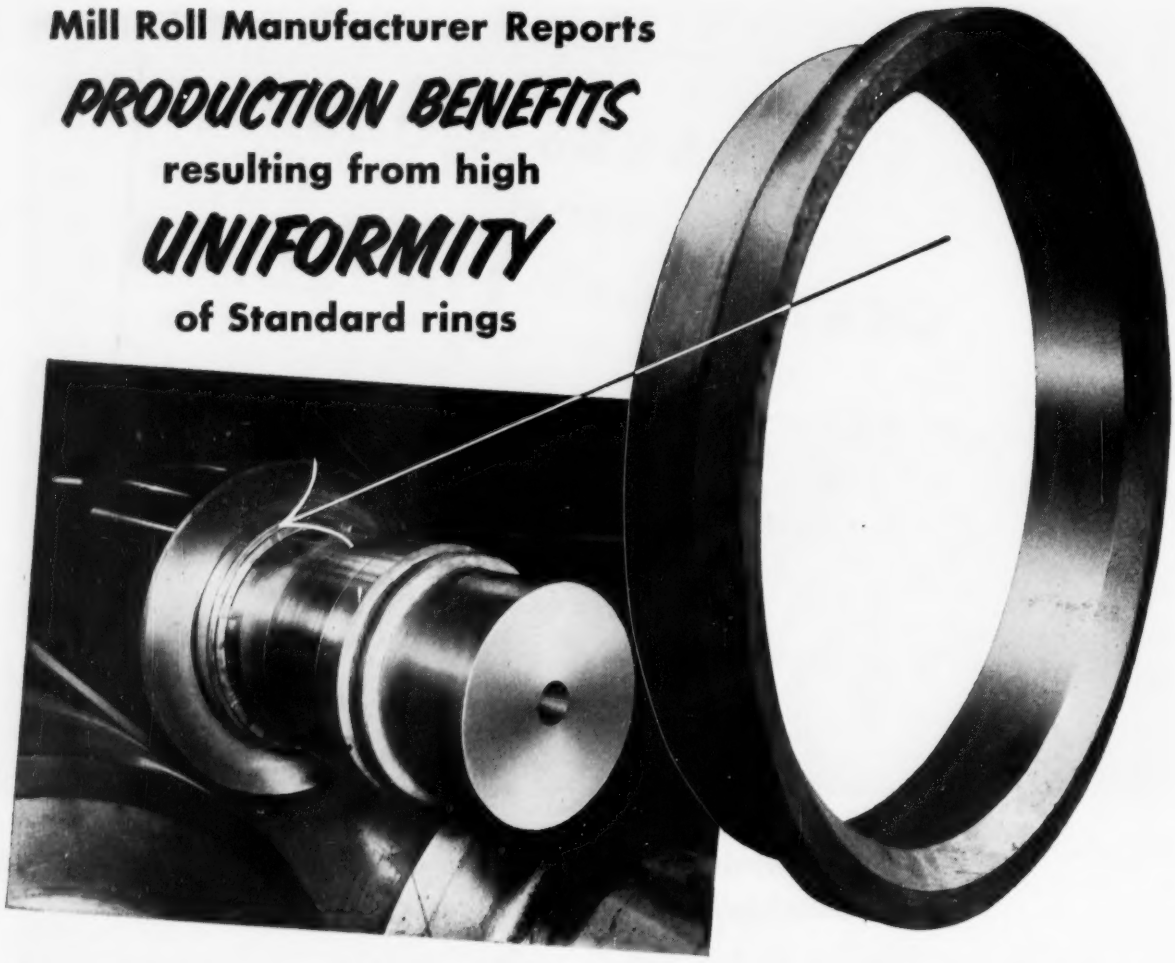

By exercising precise control of forging and rolling operations, the Standard Steel Works Division assures greater *uniformity* in the structure and analysis of each ring.

Typical of performance records is a report from a large eastern manufacturer of mill rolls where Standard rings are employed as thrust rings (inside bearing raceways) on the finished roll. Not only do they report a 50% saving in cost, but they also find that the grain structure, analysis and precise specification of the steels used in Standard Steel weldless rings is of the highest caliber.

Thus another reason why you should standardize on Standard Steel rings and flanges to protect the quality of your products is the fact that you can be certain of Standard's uniformity in manufacture.

ONE OF SIX REASONS why you should always call Standard Steel for rings and flanges.

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2. Uniformity—assured by precise control of forging and rolling operations.

3. Testing—radiographic tests, tensile tests, hardness tests, ultrasonic probing of internal structure, etc.

4. Capacity—unsurpassed ability to produce weldless rings all the way up to 144″ O.D.

5. Experience—produced by skilled workmen with 20 to 40 years experience.

6. Fast Service—a vital factor in the continuing growth of Standard Steel for over 150 years.

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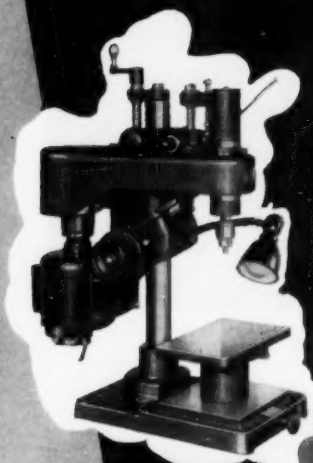

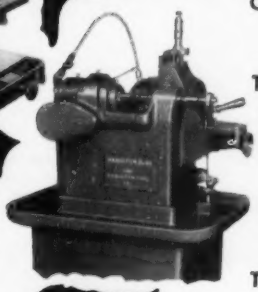

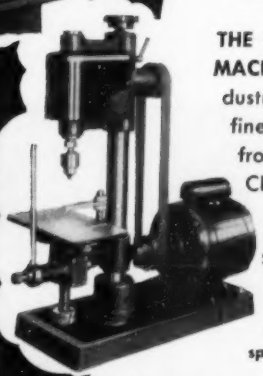

If your work can be done within the framework of the specifications of these machines you can not buy a more precise tool than one bearing the Hamilton nameplate.

THE HAMILTON VARIMATIC® SUPER SENSITIVE DRILLING MACHINE is designed for the accurate production-drilling of small holes in all drillable materials. Its capacity ranges from .004" to .3125" and its spindle speeds, which range from 840 to 9300 R.P.M., are infinitely variable.

CLEARANCES Center of chuck to column..... 5"
Round table to chuck.....10"

THE HAMILTON NO. 00 PRECISION GEAR HOBBER is a machine of extra precision and extra rigidity. It is used for the generation of spur gears and pinions to 2" outside diameter of the workpiece. Alignment and trueness of the work spindle and hob spindle is held to within .0002". Accumulative error is regularly held to .0002" or less.

THE HAMILTON NO. 1 PRECISION GEAR HOBBER generates spur and spiral gears, worms and worm gears, splined shafts, gear sectors and pinions of extra accuracy and at high production speeds. The alignment and trueness of the work spindle and hob spindle is held to within .0002". Accumulative error is regularly held to .0002" or less. Maximum workpiece diameter is 6".

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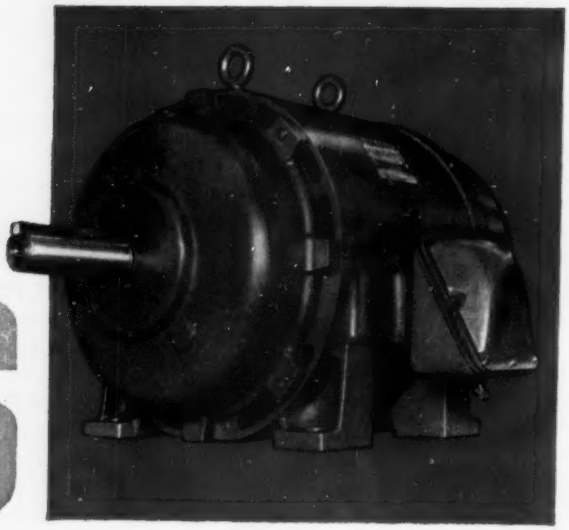

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CALENDAR
OF MEETINGS

January 18-22, American Institute of Electrical Engineers: Winter general meeting, Statler hotel, New York. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

January 19-21, Caster & Floor Truck Manufacturers Association: Winter meeting, Hotel New Weston, New York. Association address: 27 E. Monroe, Chicago 3. Executive secretary: H. P. Dolan.

January 20, American Society of Body Engineers: Annual meeting, Detroit. Society address: 100 Farnsworth Ave., Detroit 2. Secretary: Edward Wachnicki.

January 20-21, Steel Shipping Container Institute Inc.: Winter meeting, Hampshire house and Hotel Pierre, New York. Institute address: 600 Fifth Ave., New York 20. Secretary: L. B. Miller.

January 21, American Coke & Coal Chemical Institute: Western regional meeting, Drake hotel, Chicago. Institute address: 711 14th St. NW, Washington 5. President: Samuel Weiss.

January 21-22, Steel Plate Fabricators Association: Annual meeting, Palmer House, Chicago. Association address: 37 W. Van Buren St., Chicago 5. Secretary: J. Dwight Evans.

January 21-22, National Industrial Conference Board Inc.: General session for all associates, Hotel Astor, New York. Board address: 247 Park Ave., New York 17. Secretary: Herbert S. Briggs.

January 22, Malleable Founders' Society: Semi-annual meeting, Hotel Cleveland, Cleveland. Society address: 1800 Union Commerce Bldg., Cleveland 14. Managing director: Lowell D. Ryan.

January 25-26, Industrial Furnace Manufacturers Association Inc.: Annual meeting, Warwick hotel, Philadelphia. Association address: 412 Fifth St. NW, Washington. Secretary: T. F. Sheckels.

January 25-28, Plant Maintenance & Engineering Conference and Show: Hotel Conrad Hilton and International Amphitheatre, Chicago. Information: Clapp & Poliak Inc., 341 Madison Ave., New York 17.

January 26, Cutting Tool Manufacturers Association: Annual meeting, Lochmoor Club, Detroit. Association address: 416 Penobscot Bldg., Detroit 26. Executive secretary: Martin J. Ewald.

January 26, Mining & Metallurgical Society of America: Annual meeting, Mining Club, New York. Society address: 11 Broadway, New York 4. Secretary: Lt. Col. Donald M. Liddell.

January 27-29, American Management Association: Marketing conference, Hotel Roosevelt, New York. Association address: 330 W. 42nd St., New York 36. Vice president-secretary: James O. Rice.

January 29, Cleveland Chamber of Commerce: Northern Ohio personnel and executive conference, Hotel Carter, Cleveland. Information: William G. Donaldson, Cleveland Chamber of Commerce, Union Commerce Bldg., Cleveland.

January 29-30, Annual Industrial Engineering Institute: University of California, Berkeley, Calif. General chairman, Bruce G. McCauley, University of California, College of Engineering, Berkeley 4, Calif.

January 31-February 2, Hydraulic Institute: Annual meeting, Edgewater Beach hotel, Edgewater Beach, Fla. Institute address: 122 E. 42nd St., New York. Secretary: Frank P. Anderson.

January 31-February 4, Associated Equipment Distributors: Annual meeting, Hotel Waldorf-Astoria, New York. Association address: 30 E. Cedar St., Chicago 11. Secretary: P. D. Hermann.

February 1-3, Annual Industrial Engineering Institute: University of California, Los Angeles. General chairman, Bruce G. McCauley, University of California, College of Engineering, Berkeley 4, Calif.

February 1-5, American Society for Testing Materials: Spring meeting, Hotel Shoreham, Washington. Society address: 1916 Race St., Philadelphia 3. Executive secretary: Robert J. Painter.

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STEEL

January 18, 1954

Metalworking Outlook

Unemployment: Not Alarming

Lay-offs are continuing, but the employment situation is still good. Unemployment now is less than 2 million (p. 55). The CIO charges that Department of Commerce's jobless figures are low by about 700,000. Even if that is true, the unemployment picture would still not be as alarming as the union paints it. There are already substantial new hirings or rehirings to offset some of the lay-offs. Deere & Co. plans to call back 500 by Feb. 1 at Waterloo, Iowa. Chevrolet has begun hiring for anticipated assembly-line production of Corvettes in St. Louis. Avco Mfg. Corp.'s New Idea Farm Equipment Division plant at Coldwater, O., has summoned 300 laid off last fall.

Labor Prospects for 1954

Look for an average wage increase during 1954, including fringe benefits, of about 5 cents an hour. That will develop because many workers will receive the automatic improvement boost of about 5 cents, prompting other unions to aim for a similar gain. There will be much discussion about the guaranteed annual wage, but it's unlikely that it will make much headway this year. Man-days lost by strikes during the year have a good chance of being even fewer than in 1953 when 27 million were lost, the second lowest total since the end of World War II.

The Pay Is Good

The average monthly starting salary for graduate engineers in the Cleveland area is $352.03. Because of the diversity of industry there, the region is a good indicator of national practices. Highest monthly starting salary reported to Associated Industries of Cleveland was $375. Lowest was $305, which is raised to $388 after a one-year trial. A year ago the average starting salary reported in the AIC survey was $301.88.

Supported Optimism

Makers of consumer durables, those volatile products that are quickly affected by recessions or talks of recessions, are backing up their optimism by hard facts. Philco Corp., for example, predicts an increase of $35 million in its sales of major appliances in 1954, coming primarily in television, home laundry equipment and air conditioners. Westinghouse Electric Corp. will boost total capacity 45 per cent by 1957. While all of the expansion is not in consumer lines, some of it is. And the flood of new consumer products continues. One of the latest: A bottomless garbage can developed by Bardmatic Corp., Muskegon, Mich., to sell for $27.85. It's a cone-shaped can of sheet steel which decomposes refuse by a chemical catalyst. The resulting compost makes good fertilizer.

Layaway Plan for Ordnance

The Army Ordnance Corps has a layaway plan. Government-owned production facilities in possession of private contractors will be retained by the Army rather than sold as after World War II. After contracts are

The Technical Outlook—p. 77 The Market Outlook—p. 107

completed, the prime of subcontractors will maintain the facilities, and many contractors will be authorized to set up a minimum number of machine tools for pilot-line production for testing and evaluation purposes.

Noise of Industry

The noise of industry is becoming a liability. Damage claims resulting from "boilermaker's ear" against a single Eastern company total $5 million. And Albert Wojcik, employed by Green Bay Drop Forge Co., Green Bay, Wis., has just been awarded $2429 damages for partial loss of hearing in a case that's unique because Mr. Wojcik never lost a penny in wages as a result of his infirmity. Sound experts say that prolonged noise from 100 to 120 decibels will cause some hearing loss for most workers. The average noise in factories is 85 decibels.

Not for the Asking

Small Business Administration from Oct. 1, 1952, to Jan. 6, 1954, had approved 25 loans for $1.67 million and rejected 26 calling for $2.02 million. As of Jan. 6, a cumulative total of 261 loan applications for $17.65 million had been received.

A Switch to Cast Iron

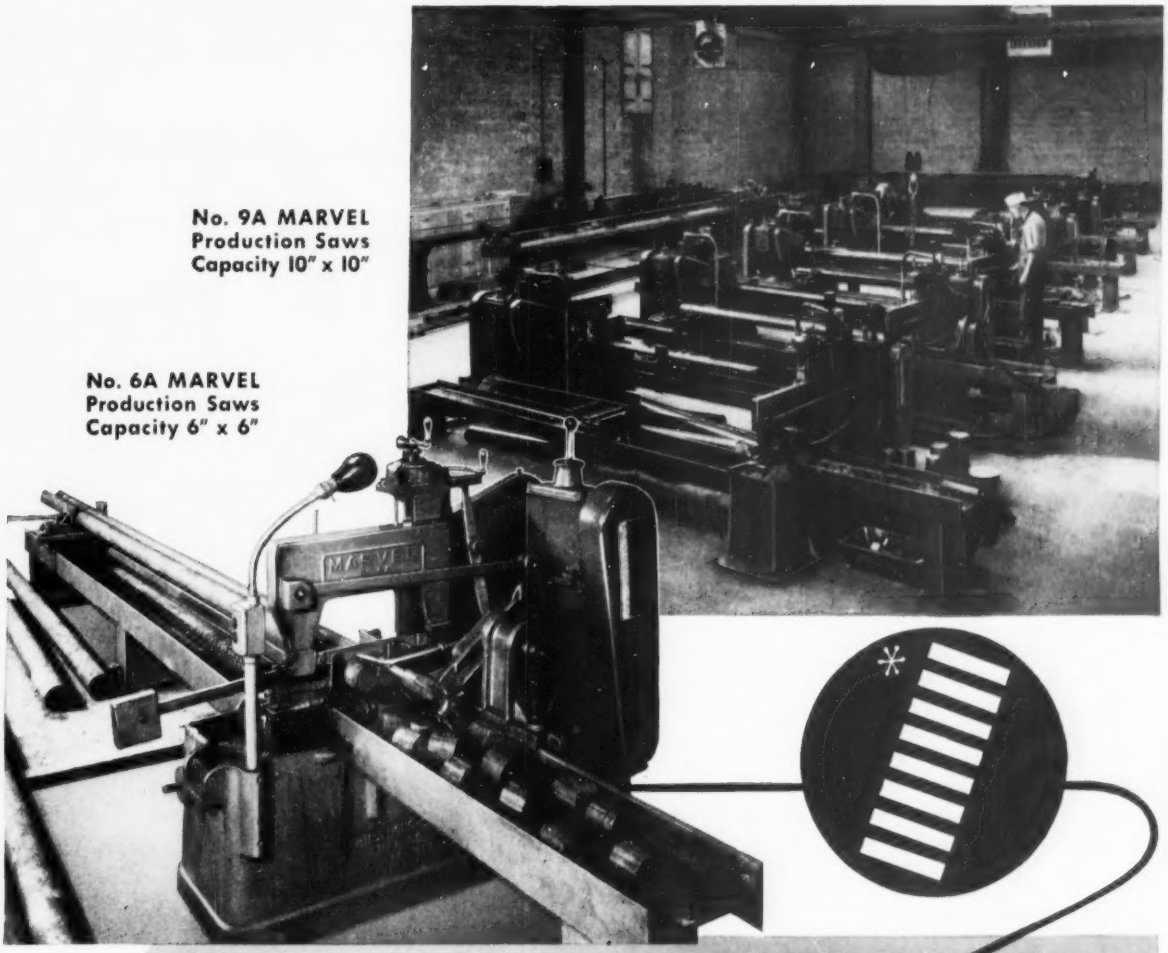
Westinghouse Electric Corp. is switching from steel to cast iron for the frames—both stator frame and end-brackets—of its new line of electric motors. The company, which had pioneered in the use of steel for motor frames, says that developments in casting techniques now throw the balance in favor of cast iron. The frames of the new motor, in line with the revised horsepower standards, are smaller for the same horsepower rating.

Straws in the Wind

Interstate Commerce Commission invites suggestions for rules covering piggy-back carrying of truck-trailers by railroads before Feb. 15 . . . Directors of Nash-Kelvinator Corp. and Hudson Motor Car Co. late last week were considering details of the proposed merger . . . Kaiser Motors Corp. is getting ready to resume auto production in its Toledo plant . . . Railroads granted a 5-cent hourly boost to firemen and enginemen, the same terms as reached with trainmen last month . . . Timken Roller Bearing Co. has resumed operating a 40-ton electric furnace because of improved alloy steel demand.

This Week in Metalworking

Hard-pressed farm equipment makers are striving for a $1.7-billion volume in 1954 (p. 37) . . . Three machine tool builders now offer leasing plans (p. 39) . . . Truck-trailer manufacturers foresee almost as good a year in 1954 as in 1953 when more than 100,000 units were produced (p. 39) . . . Although titanium sponge production has grown phenomenally, it's still far short of the 22,000-ton goal set by the U.S. (p. 41) . . . Odds are that little important new labor legislation will be passed by this Congress (p. 43) . . . For tips on improved employee communications, see p. 48.



Eight of these MARVEL 9A Saws have already earned *Service Stripes**

Eight of these high speed MARVEL Production Sawing Machines at the Accuracy Steel Cutting Company, Hazel Park, Michigan, (a suburb of Detroit) operated almost continuously thruout the last war—cut up thousands of 20 ft. bars into accurate slices, pieces and lengths, for war production.

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Left of Congress

President Eisenhower's state of the union message to congress, viewed in conjunction with his earlier fireside chat to the people and his later messages on farm policy and amendments to the Taft-Hartley Act, provides a fairly clear idea of the course he intends to pursue in administering the affairs of the nation in the short-term future.

It is plainly evident that his advisers have sold him solidly on a program that is definitely to the left of anything that Congress is likely to approve. It is almost unbelievable, but unquestionably true, that in many of the measures he advocates in these early messages he is as far off base from the majority thinking of both houses of Congress as was his predecessor, President Truman. For this reason, he is almost certain to receive some rebuffs, although perhaps not as numerous or as embarrassing as those taken on the chin by Mr. Truman.

One reason why he should and probably will fare better at the hands of senators and representatives than did his predecessor is that his basic concept of the role of the federal government remains sound. He is still in favor of a more limited government. He is for reducing expenditures, balancing the budget, taking the government out of activities in which it does not belong and in a general way shifting public thinking away from government paternalism and toward a sense of greater individual responsibility.

Unfortunately the fact that he still sticks to these original, sound beliefs is somewhat blurred by the obvious concessions his advisers have persuaded him to make to political expediency. In their attempts to keep him in the "middle of the road" they are trying to have him please too many diverse types of people.

The President still has time to define his attitude on many of the current important issues in more specific terms than he has employed to date. As he moves from the general to the specific, millions of Americans will hope sincerely that he will not permit political considerations to interfere too much with the sound principles of his original program.

E. L. Shaner

EDITOR-IN-CHIEF

TIME TO BE OBJECTIVE: At this early stage in the new year one finds a few outspoken hardheads who claim that the state of business is worse than it is being pictured by spokesmen for industry and government. One senator has made small headlines by charging that the government's figures on unemployment are too low by nearly a million jobless. There

are many others who, while not as specific as this senator, indicate by their utterances that for political reasons they would be delighted if the present federal administration could be subjected to the embarrassment of a sharp recession in business. To be absolutely fair, one must also concede that under present conditions there always is the possibility that—again for political reasons—spokesmen for the incumbent administration will be inclined to boast that the nation's economy is better off than it really is.

We hope sincerely that the business trend of the next few decisive months will not be affected too much by politically inspired psychological propaganda.

* * *

HERE'S SOLID EVIDENCE: In connection with the statements by politically minded spokesmen as to what the business outlook may be, it is well to remember that there are a few reliable guides as to the status of employment. If you are in a metropolitan area, there is a state or federal employment agency which compiles fairly accurate statistics as to the number of persons seeking jobs and the number gainfully employed. In almost every employment area—large or small—there are figures to show how the current job situation stacks up.

But beyond these official and semiofficial statistics about employment, there is another indicator that is readily available and significant. It is the want-ad section's in the big newspapers. The last time we counted, which was about a week ago, the "help-wanted" ads were outnumbering the "jobs-wanted" ads by about 15 to 1.

* * *

THIS IS NO MOUNTAIN: At his press conference last Wednesday President Eisenhower took occasion to tell reporters that the administration's plan to channel defense work to areas of surplus labor has been misunderstood. When the plan was first announced some senators and representatives complained bitterly, claiming that it would transfer work from their territory to other areas. Last Wednesday the President explained that nothing in the plan would operate to shift an entire defense order into an unemployment area. Instead only a relatively small percentage of an order would be shifted.

As a matter of fact, it is too bad that the subject was mentioned in the first place, because the effort to transfer enough defense work into most of the areas of labor surplus to do any appreciable good would involve numerous difficulties and fantastic costs.

* * *

SLIM PICKINGS HERE: According to a recent tabulation, the areas of so-called "substantial labor surplus" are Lawrence and Lowell, Mass.; Providence, R. I.; Gloversville, N. Y.; Scranton, Wilkes-Barre, DuBois, Johnstown, Uniontown and Altoona, Pa.; Atlantic City, N. J.; Cumberland, Md.; Parkersburg, Fairmont and White Sulphur Springs, W. Va.; Terre Haute and Vincennes, Ind.; Kenosha, Wis.; West Frankfort, Ill.; Madisonville, Pikeville, Hazard, Harlan and Corbin, Ky.; Big Stone Gap, Va.; Newport, Tenn.; Asheville, Winston-Salem and Durham, N. C.; Jasper, Ala.; Rockmart, Ga.; Albuquerque, N. Mex.; and Tacoma, Wash.

Many of these areas are very small in terms of labor supply. Most are "single industry" towns where employment depends largely on textiles, coal, railroad shops, resort hotels and tobacco. Of the 33 localities listed, probably not more than a half dozen have the plant facilities or the skilled labor required to tackle even the simplest type of defense orders.

If there is surplus labor in Asheville, Atlantic City or White Sulphur Springs, the remedy will come from more tourists and conventions, rather than from abortive attempts to shift defense orders.

* * *

FACTS VERSUS RUMOR: Throughout the years American industry has been advancing to its present position of world prestige, it has been engaged in the interesting problem of trying to figure out what is the most effective method of helping employees to understand company policy. In the small plant, the problem is not too difficult because almost everybody knows by the inevitable grapevine what is "cooking."

In the larger plants, the problem is simply one of distributing authoritative information to employees before unexplained actions spread rumors that may well lead to serious results—even including prolonged strikes. The technique of this new weapon (p. 48) is called "Employee Communications." Its purpose is to give the job holder everything he needs to know to perform his task not only intelligently, but enthusiastically.

Safety Plate... Quick Delivery

The Famous Inland 4-Way Design

The next time you're looking for an answer to an under-foot problem where sure traction, easy maintenance and long wear are important, call Ryerson for Inland 4-Way Safety Plate.

The lugs in this attractive Inland pattern are hot rolled at right angles to each other to provide safe footing in all directions. There are no pockets where liquid or dirt can collect, so the surface is easy to drain and sweep.

This firesafe, long-lasting plate is available in two pattern sizes and a wide range of thicknesses. You can order it sheared, bent or punched to your specifications. Our stocks are complete—and we can assure you of immediate shipment.

PRINCIPAL PRODUCTS: CARBON, ALLOY & STAINLESS STEELS—BARS, STRUCTURALS, PLATES, SHEETS, TUBING, MACHINERY & TOOLS, ETC.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND • DETROIT
PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

From flat sheet to finished product . . . THE ZINC COATING ON INLAND TI-CO® STAYS PUT!

Nine operations to make this muffler cap from Inland's Ti-Co galvanized steel sheets . . . nine chances for the protective zinc coating to crack, flake or peel. But Ti-Co passes each test. Its tight zinc coating actually stretches and flows with the base metal as it's blanked, put through five successive draws, trimmed, pierced, flanged, re-formed and finally expanded to size. No need for dipping or touching up . . . the coating on the finished product remains tight and uniform from flat Ti-Co drawing quality sheet to finished product.

Ti-Co is continuously annealed and galvanized by the patented Sendzimir process, which eliminates the brittle iron-zinc layer found in ordinary galvanized sheets. This flexible, uniform coating means Ti-Co galvanized products are easier and cheaper to produce, and stay serviceable and good-looking longer.

Because of the terrific demand for this superior quality sheet, you may sometimes find Ti-Co difficult to obtain on short order. But please bear with us. We're doubling our capacity during 1954 to help assure plenty of Ti-Co for everyone. Ti-Co is worth waiting for!

To get the whole story . . .

Write for our new Ti-Co catalog. It tells how Ti-Co can help you produce better galvanized products for less—and turn out new products not practical with ordinary galvanized sheets or other metals

INLAND STEEL COMPANY
Dept. T-2, 38 South Dearborn Street
Chicago 3, Illinois
Sales Offices: Chicago, Milwaukee, St. Paul, St. Louis, Davenport, Kansas City, Indianapolis, Detroit and New York

INLAND TI-CO® GALVANIZED SHEETS WITH THE ZINC COATING THAT ROLLS WITH THE PUNCH

du Pont

Farm Equipment Shipments

1949	$1,813,008,000
1950	$1,792,427,000
1951	$2,204,491,000
1952	$1,933,335,000
1953	$1,700,000,000*
1954	$1,700,000,000*

Source: 1949-1952, U. S. Bureau of the Census. * Estimated by STEEL.

Farm Equipment Makers Cultivate Their Markets

They have to because 1953 was the worst year since 1947. Here's what one of the first metalworking industries to feel a pinch is doing to spur sales

FARM MACHINERY makers witnessed the passing of 1953 with no regrets. As a manufacturing and sales year it was the poorest since 1947. What's more, this drastic development had not been expected.

The outlook for 1954 is far from rosy. But realizing that heads-up salesmanship and service to farmers can be productive, the industry feels it can at least equal 1953 sales and maybe exceed them. It is doubtful, however, if manufacturing activities can come up to the previous year's level because of the substantial inventories of most lines of equipment.

Outlook—Estimated sales of $1.7 billion during 1953, as shown in the accompanying table, were a drop of 12.5 per cent from the previous year and were off 23 per cent from the all-time top of 1951. Prospects are that little of the lost ground is going to be recovered this year.

Almost entirely responsible for what happened in 1953 was the decline in farm prices—down about 10 per cent from the eight-year average. Another influence in the drop in farm machinery sales last year was the slide in exports—off 32 per cent from the eight-year average.

Less Receipts—Farmers received about $28.1 billion from marketings in the first 11 months of 1953. This was about 4 per cent less than in the like period of 1952. Prices have averaged about 10 per cent lower than in 1952, but total marketing volume has been about 5 per cent higher.

For the full year 1953, farm income is estimated at $31 billion. Although this would be the third largest in United States history, its drop from about $32 billion in 1952 and the record high of $33 billion in 1951 was sufficient to have profound effect upon the buying practice of farmers.

The Same for 1954—Experts in the Department of Agriculture see little change for farmers in 1954 from 1953. The cost-price squeeze will continue to bear down on many farm families but probably not more heavily than last year. Many farmers have started to adjust to

lowering of incomes from exceptionally high wartime and early postwar levels. This has included reduced expenditures for new farm equipment.

Agriculture Secretary Ezra T. Benson comments that 1953 total farm output was close to the all-time high of 1952 despite serious droughts. He expects strong consumer demand to prevail in 1954. He also states there may be some expansion in demand in the foreign market. The latter would assist in reducing the huge surpluses of many products existing today.

Supporting—This is the framework which will support farm machinery activity in 1954. Appraisals of equipment manufacturers range from a slight improvement in sales to a 10 to 20 per cent dip from 1953. Consensus is that sales won't go much lower and are more likely to turn up.

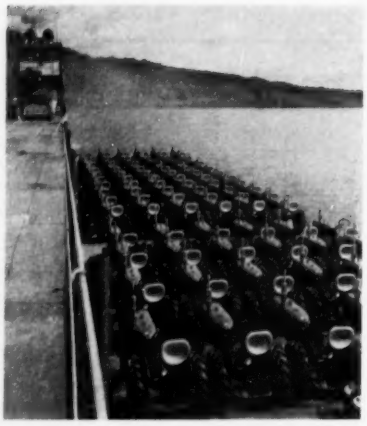
H. H. Bloom, president, Massey-Harris Co., Racine, Wis., observes that prospects are brighter now than they were six to eight weeks ago. He thinks sales will equal 1953 and may be better if grain belt crops hold. Prospects for the latter are the best in last three years.

Accent on Quality—In the opinion of John T. Brown, president of J. I. Case Co., Racine, Wis., there will be a great need for large quantities of quality farm machinery in 1954. He adds that competition will be keen and that sales are going to be made on the farm and by the retailer who studies the farmers' requirements.

Farm equipment makers agree that sales in 1954 will depend largely on salesmanship that can show the farmer how new modern equipment can cut his cost of operations or increase his yield. W. A. Roberts, president, Allis-Chalmers Mfg. Co., believes the farmers' readjustment may be leveling off.

Lower Prices?—John L. McCaffrey, president, International Harvester Co., Chicago, is less optimistic and voices a fear concerning price cutting that harasses all manufacturers. Major relief in the farm problem, he says, must come by revival of exports of farm products.

Most drastic reductions in farm equipment output during 1953 came after midyear. Some companies reported production in the last four or five months of 1953 was down 60 per cent from 1952 levels. Inventories of almost all types of equipment except crawler tractors are abnormally high and must be worked down before production of new units can be geared directly to sales.



Tractors on the River

A barge load of 92 International Harvester Co. Farmall tractors, fresh off the Louisville Works production line, moves serenely down the Ohio river, bound for Memphis, Tenn. transfer

Opportunity in Waste—Perhaps more attention will be paid to wastes in farming. If so, this may be a key to improved sales. If machinery makers can figure out a way to reduce these wastes, they will increase income of farmers materially and make them better customers for better machinery.

To illustrate, combines and corn pickers still leave a lot of grain in the field. This waste runs as high as 10 to 25 per cent and that can mean the difference between affluence and poverty.

Opportunity in Small Tractors—The farm implement industry is watching with interest a new venture of Sears-Roebuck & Co. which in its spring general catalog and selected retail stores this month is announcing a new low-priced unconventional riding tractor planned especially for farmers with working areas up to 30 acres (STEEL, Dec. 28, p.59).

More than a million families live on acreages from 3 to 30 acres. The mail order house may be tapping an entirely new market.

Manufacturers' Profits Dip

Profits, although declining in the third quarter 1953, were 11 per cent above 1952 period

MANUFACTURERS' PROFITS after taxes in third quarter, 1953, dipped 5 per cent below the preceding quarter, but were 11 per cent higher than in third quarter, 1952. Profits are estimated at $2.9 billion for third quarter, 1953; $3.0 billion for second quarter, 1953; and $2.6 billion for third quarter, 1952.

That's according to figures jointly released by the Federal Trade Commission and Securities & Exchange Commission. The release points out the 11-per-cent gain over 1952 reflects the effects of the steel strike during the 1952 period.

All But One—Nearly all metalworking industry groups in the FTC-SEC report shared in the 11 per cent gain. The one exception: Machinery (except electrical) producers, whose profits after taxes slid to $210 million or 12 per cent under third quarter, 1952.

Primary iron and steel producers' profits after taxes rose to $236 million in third quarter, 1953, up 86 per cent over the same period in 1952; fabricated metal producers' profits climbed to $142 million, up 10 per cent; electrical machinery manufacturers' profits increased to $159 million, up 14 per cent; profits of manufacturers of transportation equipment, except automobiles, gained to $68 million, up 11 per cent; motor vehicles and parts producers' profits advanced to $236 million, up 19 per cent; and instrument makers' profits after taxes sprang to $44 million in third quarter, 1953, up 7 per cent over third quarter, 1952.

The Trend—Dollar sales of manufacturers followed the same trend as profits after taxes, decreasing 3 per cent in third quarter, 1953, under the preceding quarter, but increasing 9 per cent over third quarter, 1952. Manufacturers' sales are estimated in the FTC-SEC report at $66.5 billion in third quarter, 1953; $68.7 billion in second quarter, 1953; and $60.7 billion third quarter, 1952.

New Tool for Tool Sales

A few machine tool builders try leasing as an approach to 1954 sales

LEASING MACHINE TOOLS directly from the tool builders is becoming the metalworking industry's newest opportunity to re-equip with the latest in machine tools. It's also indicative of the tool builders' approach to the increasingly tough competition of 1954.

Two machine tool builders are already getting their feet wet in leasing early this year, and at least three others are testing the temperature of the water with preliminary inquiries. DoAll Co. has had a tool leasing program for some time.

Entrants — Kearney & Trecker Corp., Milwaukee, Wis., this week announces the details of a new tool-lease program of selling in addition to its straight selling on regular terms and straight selling with term contracts. And for the past month, Warner & Swasey Co., Cleveland, has had a machine tool rental program in effect.

In three Warner & Swasey leasing plans, each available with or without an option to purchase, the lessee pays either a gradually decreasing or flat rate in rental each month. A gradually decreasing option-purchase price is set for each year should the lessee decide to buy.

No Bonanza—Still only in the pioneering stage, leasing of machine tools from tool builders will never supplant the older methods of selling. If talked-about tax changes occur, leasing will lose some of its advantages. But, until then, aggressive machine tool builders are hopefully sharpening this new sales tool to cut through buyers' resistance ahead.

Tool Exhibit Pulls Visitors

The First International Machine Tool Exposition, a permanent machine tool exhibit in Brooklyn, N. Y., has had over 9000 visitors in the four months it's been open.

During the first two weeks of the exhibit, more than $250,000 worth of equipment was sold.

TRUCK-TRAILER UNIT PRODUCTION

1953	100,000*	1951	67,384
1952	58,077	1950	64,617

Source: Truck-Trailer Manufacturers Association * Estimated

Truck-Trailer Output: '53 Was Tops, '54 Looks Good

TRUCK-TRAILER production in the U. S. rolled to an all-time high in 1953 as slightly more than 100,000 units were produced, almost doubling 1952's output (see table).

Outlook for 1954 is also bright. William E. Grace, president of Truck-Trailer Manufacturers Association Inc., said at the TTMA convention Jan. 13: "We have every hope and expectation that production during 1954 will remain at this high level or even surpass it."

Military Orders Up—In the first ten months of last year output totaled 84,221 units, surpassing the previous full-year peacetime production record of 76,234 units in 1946. Government orders of 38,321 units for the period reflected the military's new policy of utilizing civilian-type trailers for all highway hauling except actual front-line operations. Civilian output for the period amounted to 45,900 units and exceeded the 50,000 mark by year end.

Of vital concern to the truck-trailer industry is the current 8 per cent federal excise tax which is scheduled for reduction to 5 per cent Apr. 1. Mr. Grace, also executive vice president, Hobbs Mfg. Co., Fort Worth, Tex., scored the tax as discriminatory and recommended a uniform manufacturers' excise levy.

Ample Capacity—The TTMA president hailed 1953 as a demonstration of the ample capacity of truck-trailer manufacturing industry to meet both civilian and defense needs. Emphasis this year, Mr. Grace said, should be on supporting the American Trucking Associations Inc. study of the "piggyback" movement and securing more favorable state and federal motor carrier regulation.

Army Cancels Contracts

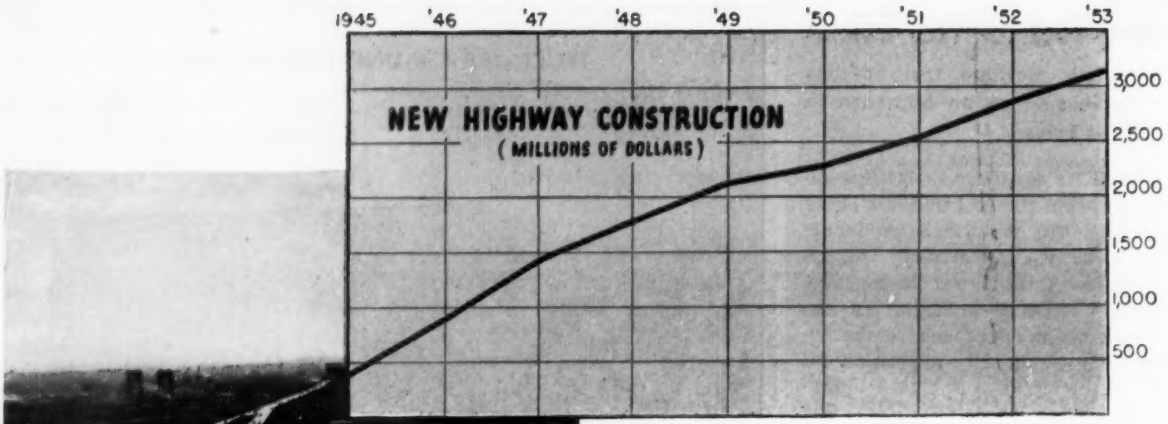
The army has canceled $140 million worth of defense contracts for jeeps, ¾-ton and 2½-ton trucks and truck trailers. Six companies producing such vehicles will wind up their commitments by about mid-1954, months ahead of schedule.

Directly affected are General Motors Corp., Reo Motors Inc., Willys Motors Inc., Chrysler Corp., Checker Cab Mfg. Corp. and Fruehauf Trailer Co.

Rail Rate Reduction Proposed

Eastern railroads have decided on rate reductions of between 18 to 20 per cent on shipments of many iron and steel products. The railroads will file the new rate schedule with the Interstate Commerce Commission early next month and, if approved, new rates go into effect 30 days after filing.

The new rate schedule applies to shipments of 40,000 pounds or more, putting the railroads on a parity with trucking charges for such shipments.



Source: U. S. Departments of Commerce and Labor

Standard Oil Co. (N. J.)

Public Pressure May Spur Road Building

Highway construction in 1953 hit an all-time high. The taxpayers' willingness to O.K. bond issues last November brightens the outlook for continued high-level activity

MOUNTING PUBLIC pressure may provide the key toward continuing the nation's high-level road construction program. In its most favorable prospect, highway construction outlay this year can possibly equal or top 1953's record $3.2 billion expenditure—with a good portion of that sum going into metalworking sales for materials and construction equipment.

An estimated 54 million motor vehicles drive a half-trillion miles on the 3.3 million miles of U. S. streets and highways. Increasing highway accidents and death tolls, growing traffic congestion and increasing property damage are providing public impetus to seek action on the local, state and federal government levels.

Deficiencies—One of the most active groups seeking to step up the nation's road building program is the American Road Builder's Association which is seeking Congressional action on a proposed 10-year program for correcting the nation's highway deficiencies. ARBA estimates that it would cost $40 billion to bring the federal-aid system of major arterial roads of the nation up to required standards.

Financing is the biggest obstacle to highway construction programs, but the high rate of endorsements of large bond issues for highway construction in the November elections demonstrated public concern over the highway problem. Another growing movement which points to continued high-level road building is the trend toward toll roads. Nine states now have toll roads in operation; four others have projects under construction.

Financing—Much of the financing talk today is centering on eliminating the practice of diverting of motor vehicle revenues to non-highway uses. Walter F. Mullady, board chairman of the American Trucking Associations Inc., suggests that federal gasoline taxes as well as federal excise taxes on motor vehicles, tires and other parts be made available to states for highway construction. Many states are already mapping out big road construction programs, including Ohio whose governor has asked that $125 million be spent in 1954 on highways and $125 million on its turnpike, now under construction.

Pointing up the importance of the nation's highway network to the nation's economy—and to metalworking—are figures by the ARBA. These show that highway transportation in all its phases accounts for approximately one-eighth of the nation's gross national product.

U. S. Boosts Exploration

The Defense Minerals Exploration Administration executed 63 new contracts during the four-month period ending in November. An evaluation of prospects resulted in the denial of 87 applications. Also, 35 applications were withdrawn. But the 80 new applications received attest to the interest created by the program.

The applications received covered 13 mineral commodities in 12 states. These ranged from a copper-nickel project in the state of Washington with an estimated cost of $303,000 to a $2000 mica exploration in North Carolina.

Terminated contracts numbered 59, with an estimated cost of

$2,052,663. Of the government's share of $1,339,219, only $783,078 was used.

Hopes for the program were bolstered by discoveries at 27 more projects that had previously been certified.

Alcoa Gets Rapid Write-Off

A $3,701,000 certificate of necessity providing for accelerated tax amortization of 25 per cent has been issued to the Aluminum Co. of America on its plant at Lancaster, Pa. Aluminum precision fasteners and screw machine products will be manufactured.

This certificate was the third largest of 75, relating to new or expanded facilities, issued by the Office of Defense Mobilization from Dec. 3 to Dec. 16, 1953.

Including the latest certificates, accelerated tax amortization on projects to cost $28,958,478,000 has been granted for 18,582 new or expanded facilities. Of this sum, 60 per cent or $17,422,611,000 is eligible for rapid depreciation.

Biggest Atom Smasher

Approval has been given by the Atomic Energy Commission for construction of the $20-million Synchroton—most powerful atom smasher devised thus far—at the Brookhaven National Laboratory, Upton, L. I.

Metal consumption in the construction of the Synchroton will be held within practicable limits through application of recent technical developments. The Cosmotron, current atom smasher champ, uses magnets weighing approximately 2100 tons to produce beams of protons with energies up to 2.3 billion electron volts. The Synchroton will require 2500-ton magnets to produce energies up to 25 billion electron volts. The new machine will use about 500 tons of copper compared with 75 tons in the Cosmotron.

Though the Synchroton will be available to atomic scientists who want to use it for research projects, such scientists are cautioned against leaving for Upton yet. Design of the new machine will take about another year and construction will require five or six years.

Titanium Is Missing the Target

Despite phenomenal growth of sponge production, it's still falling below ODM goals. Rapidly increasing needs put the pressure on for additional expansion

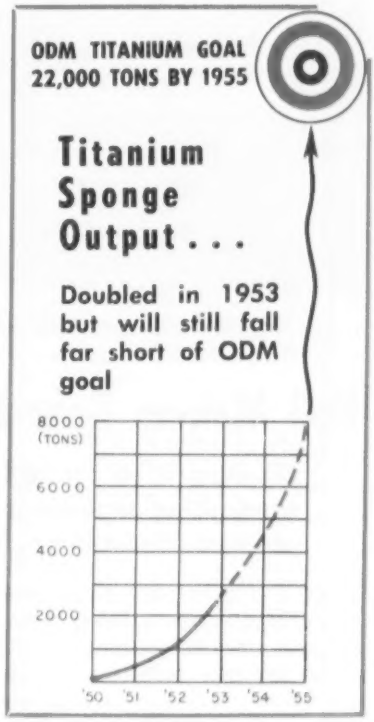
THE DOOR is being pushed open for further expansion of titanium sponge production facilities by the needs of the rocketing U. S. aircraft industry.

Output of titanium sponge reached 2250 short tons in 1953, doubling that of 1952 and well over four times that of 1951. Even with such steep increases, plus expansions due during 1954, production will fall short of the goal set up for the middleweight metal by the Office of Defense Mobilization.

Target Titanium — Current goal is for 22,000 short tons of titanium sponge annually by 1955 (see STEEL, Jan. 11, p. 34). Present expansion plans assure a total of only 13,200 short tons annually by 1956, or 8800 tons under the ODM 1955 goal.

The two major U. S. sponge producers, Titanium Metals Corp. of America and E. I. du Pont de Nemours & Co. Inc., each have expansion programs underway. These will increase their output to 3600 tons apiece by the end of 1954. Also, the Defense Material Production Authority has contracted with Cramet Inc., subsidiary of Crane Co., Chicago, for a 6000-ton-per-year facility to be built near Chattanooga, Tenn. Full production is expected there by the end of 1956. That will bring U. S. output to 13,200 tons by 1956, points out T. W. Lippert, TMCA's sales and technical service manager.

Other Sources — Besides TMCA and Du Pont, the Bureau of Mines facility at Boulder City, Nev., contributed 115 tons to 1953 titanium sponge output, and the Japanese sent 20 to 30 tons of fairly high quality sponge to this country. Elsewhere overseas, the British Ministry of Supply has contracted with Imperial Chemical Industries for 1500 tons of titanium sponge annually, though such deliveries are not expected to be available for at least two years. When they are available, they'll be used to supplement American titanium imports for use in British jet engine production.



It's the heavy demand from the American aircraft industry which is forcing upward revisions in U. S. titanium production goals too. Many military and civilian agencies are now citing a need for an absolute minimum of 25,000 tons of useable capacity by 1955, says Mr. Lippert. Other studies insist on a figure almost twice as great if American air supremacy is to be maintained.

Some Help—To help close the gap between need and availability of titanium sponge, the General Services Administration is talking with some potential new titanium producers, principally Monsanto Chemical Co. And there is a possibility that TMCA and/or Du Pont may undertake additional expansions.

Mackintosh-Hemphill

A drop in shipments will still leave good business as . . .

Roll Makers Bear Down on Quality

Expecting a 10 per cent decline this year, producers are emphasizing engineering improvements to gain sales advantages. Production in 1953 was the third best on record

DROP-OFFS in new plant construction will trim sales of forming rolls about 10 per cent in 1954. Producers who rolled up one of their best three years in 1953 say they expect to find the competition tougher this year both at home and abroad.

Reports of 15 manufacturers making the bulk of forming rolls show that 164,900 tons of cast steel, cast iron and forged rolls were shipped in 1953. That's lower than record shipments of 218,500 tons in 1951 but higher than any other year except 1950.

Basic Strength—"We expect a slight slowdown, but business will be good during 1954," says J. R. Patterson, vice president, sales, Mackintosh-Hemphill Co., Pittsburgh. A midwestern producer adds that decreasing lead time for orders makes his outlook uncertain. Increasing industrial activity in Europe is cutting into roll exports, clouding the sales picture too.

While no company contacted by STEEL expects a sharp decline in new orders for rolls, all are closely watching defense and automaking activity. Operations of those two prime users of rolled steel will determine the demand for replacement of rolls.

Customer Preference — As abnormal wartime demand for rolls subsides, producers are better able to fill customers' needs than at any time since 1949. "Delivery time on rolls for a strip mill has much improved in the past year," comments Charles S. Slonaker, sales engineer for Hyde Park Foundry & Machine Co., Hyde Park, Pa. "Delivery still requires eight weeks, but that time is shortening." Another producer complained that his customers now expect delivery "within weeks instead of months."

About 90 per cent of forming roll customers are steel mills. F. H. Allison Jr., vice president, Blaw-Knox Co., Pittsburgh, says nonferrous mills comprise 5 to 10 per cent of total sales. Blaw-Knox rolls operate in aluminum, copper, brass, titanium and lead mills.

Nonmetallic mills order less than 2 per cent of Blaw-Knox's output. Steel and iron rolls are used in production of rubber, plastic, paper, plywood, cereals and plate glass. Lukens Steel Co., Coatesville, Pa., produces rolls varying from 18 inches wide to 238 inches. Some of the widest rolls go into papermaking; some of the smallest are shipped to the chemical industry. Rolls wear out slowly in nonmetallic mills, and the replacement demand is slight.

Steel or Iron — "In our experience, steelmaking requires equal tonnages of cast iron and cast steel rolls," Mr. Patterson reports. When wear is tough, as in work rolls for strip mills, engineers specify iron. Blooming and billet mills as well as backup rolls in hot mills usually demand cast steel alloyed with nickel, chromium or molybdenum.

Mesta Machine Co., Pittsburgh, reports that its sales of forged rolls equal shipments of cast iron or steel rolls. The forged product is used in four-high cold rolls and in nonferrous mills. Mesta also produces a forged-steel sleeve to apply over a worn-down cast steel roll.

Stressing Quality — Competition is pinching some producers as new plant construction dips. "We trace our improving sales record to quality production, despite growing competition," explains Harry Eisenman, president, American Roller Die Corp., Cleveland. That producer of welded tubing forming rolls expects sales to improve this year.

"Rolls look deceptively simple," warn production men at United Engineering & Foundry Co., Pittsburgh. "They are tools so delicate that surfaces must be ground to within a thousandth of an inch. Intensive scientific research is reducing the number of 'bad rolls', lengthening the life of all rolls." Research at United has found uses for about 200 grades of steel and 300 to 400 grades of iron for its standard and special rolls.

Tall and Short — Redoubling their engineering efforts to spur sales, Blaw-Knox has developed rolls ranging in size from 150 pounds to 132,000 pounds. Diameters vary from six inches to 59 inches. Largest sizes are backup rolls for plate mills.

Despite uncertainty in market conditions, roll engineers expect quality development and production to pay off in healthy sales in 1954.

Labor Laws: No Drastic Changes Soon

Conditions in Congress indicate labor laws will remain much as they are during the present session. November congressional elections make labor legislation a hot potato

LONG-AWAITED answer to what President Eisenhower would ask for in labor legislation came last week as an anti-climax.

The President requested a series of amendments to the Taft-Hartley Act, adding that he believed "no drastic legislative innovations are desirable or required at this time." With November congressional elections haunting capitol hill like a specter, Republicans and Democrats alike are leery of this political hot potato which could give their opposition new grounds for attack but supply little or no campaign ammunition to themselves.

Little, If Any—As a result of these two conditions, enactment of any significant labor legislation in this session of congress probably will be by-passed

Among President Eisenhower's recommendations was a secret pre-strike vote for employees under government supervision, eliminating the chance of a strike being ordered solely by union heads.

Other Taft-Hartley recommendations by the President would limit the so-called union-busting features of T-H; make the National Labor Relations Board injunction application discretionary instead of mandatory in secondary boycott cases; authorize the President in national emergency strikes to reconvene the NLRB fact-finding board and direct it to make recommendations for a settlement; allow the amusement, maritime and construction industries' employers and employees to write prehire contracts without a representative election and shorten the time from 30 days to 7 days for new employees to join the union representing them in those industries. Another Eisenhower recommendation would require employers to sign non-communist affidavits as now required of union leaders.

Samuel K. McConnell (Rep., Pa.), chairman of the House Labor Committee, put still another of the President's recommendations on the "must" list. That was the one dealing with regulation by state or federal government agencies of union welfare funds.

Uncertain Fate—While Senator H. Alexander Smith (Rep., N. J.), chairman of the Senate Labor Committee, introduced S.2650, containing all the President's proposals for T-H amendments, and expressed hope that the committee would get to the bill immediately, it's fate is uncertain. Republican senators shie away from the labor committee. A Democratic majority on the Senate labor committee would probably block consideration of the administration's bill and result in no legislation at all.

There's very little enthusiasm for enacting labor legislation in the current congressional session on capitol hill.

T-H Proposals "Ill Advised?"

President Eisenhower's proposed changes in the Taft-Hartley law are "ill advised", says David McDonald, president of the United Steelworkers of America—CIO.

Mr. McDonald feels that the proposed secret strike ballot would lead only to "prolonged and intensified industrial strife."

Small Business Gets Increase

Small business got a 35-per-cent increase in dollar value of air force contracts in July through October, 1953, over the same four-month period of 1952.

Contracts awarded to small business during those four months of 1953 amounted to $108,669,000 including $76 million for 577 prime contracts and the balance in 185,194 small purchase orders for housekeeping items.

These awards do not include subcontracts placed by private prime contractors of the air force with small business firms.

Dip Forecast for Rail Shipments

Total commodity shipments in the U. S. in first quarter, 1954, are expected to be 1.4 per cent less than in the same period of 1953, according to forecasts by regional shippers advisory boards released at a meeting of the Atlantic States Shippers Advisory Board in Washington Jan. 6 and 7.

For all districts, iron and steel shipments are expected to decrease by 6.3 per cent, other metals shipments down 3.1 per cent, machinery and boilers shipments down 4.9 per cent and automobile and truck shipments down 16.1 per cent.

Appointment in Washington

Roger F. Hepenstal has taken a leave of absence as vice president for manufacturing operations, American Can Co., New York, to serve as director of cataloging, standardization and inspection in the office of the assistant secretary of Defense for Supply and Logistics.

By E. C. KREUTZBERG *Washington Editor*

Congress Frowns on Half of the President's Legislative Ideas

REPUBLICAN LEADERS in Congress are gagging over some of President Eisenhower's proposals.

Chairman Dan Reed (Rep., N. Y.) of the tax-writing House Ways & Means Committee will oppose the President's recommendations for extension of excise and corporate income taxes at present levels beyond Apr. 1.

Sen. Harry F. Byrd (Dem., Va.) promises to renew his fight of last session when he successfully prevented getting the debt ceiling raised from the present $275 billion limit.

Chairman John Taber (Rep., N. Y.) of the House Appropriations Committee says he'll pursue an off-with-their-heads policy on appropriations requests, especially for defense.

Practically no congressmen want to tackle labor law revisions. As a result, the Taft-Hartley Law at the end of this session will probably be substantially the same as it is now. (For more detail on T-H, see p. 43.)

Other proposals, such as to expand the federal social security coverage, have good support. But all in all, current Washington feeling is summed up by this comment by a veteran observer: "If the President gets 50 per cent of what he is asking of Congress, he will be doing well." Here's why:

Trouble in Taxes . . .

House Speaker Joseph Martin (Rep., Mass.) says the Republican House leaders will have "the greatest difficulty" in passing the President's proposal to extend the excise and corporation income taxes at present levels beyond Apr. 1. Whether even a compromise proposed by Ways & Means Committeeman Richard Simpson (Rep., Pa.) could win is in doubt. He would extend the 52 per cent rate, but shift normal and surtax rates to give smaller corporations a better break at the expense of larger ones. Under that scheme the estimated revenue loss would be $300 million a year.

Nor is there great enthusiasm for the bill of Rep. Noah M. Mason (Rep., Ill.) which calls for a 5-percent manufacturers' sales tax in lieu of all present excise taxes except those on alcoholic beverages and tobacco and exempting food, drugs, seeds, fertilizers and a few other products.

The Senator Objects . . .

The House will probably repeat the approval it granted last year to the administration's request for an increase in the debt limit, but trouble will come in the Senate Finance Committee from Senator Byrd.

The senator has some strong support among Senate colleagues and even some tacit approval in the House. Chairman Taber of the House Appropriations Committee said even before Congress reconvened that the budget could be held to about $59 billion for fiscal 1955 and that it could be balanced in that year. The President in his State-of-the-Union address implied a $66-billion budget for fiscal 1955.

Suffrage Suffering . . .

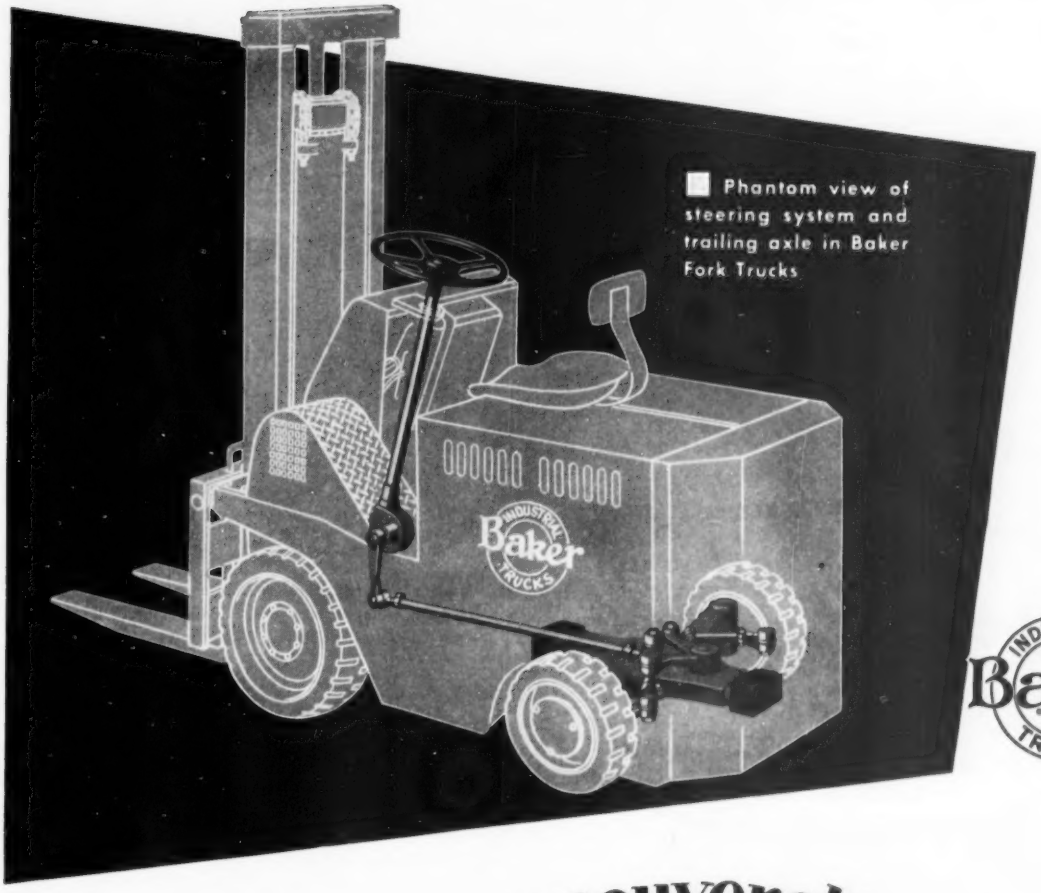
Vice President Richard Nixon's belief that the recommendation to give 18-year-olds the right to vote "has a very good chance at passage" is considered somewhat optimistic. Chairman Chauncey Reed (Rep., Ill.) of the House Judiciary Committee said Congress should "go slow" as it does not necessarily follow that "a man old enough to fight is mature enough to vote."

Social Support . . .

So far, Congress shows signs of going along substantially on a 100-per-cent basis with the President's social security expansion program and with his recommendation for federal financial assistance of private and nonprofit medical insurance and hospitalization plans. The President's about-face in waiving opposition to the Jan. 1 increase in the payroll tax deduction from 1½ to 2 per cent was well received. Now the administration plans to ask that the rate be made effective on the first $4200 of annual income instead of the former $3600, and chances for congressional acceptance are considered good. The Senate Public Welfare Committee has set up as its first order of business consideration of the President's medical insurance plan and will prepare a bill without delay.

REP. TABER REP. REED SEN. BYRD

. . . they object to some of the President's proposals



■ Phantom view of steering system and trailing axle in Baker Fork Trucks

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The most maneuverable fork truck

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Automotive type steering assembly with ball-type joints and anti-friction bearings in the steering linkage give you a truck as easy to handle as your automobile. Proper steering geometry minimizes "scrubbing" of tires. The wide-angle steering axle is mounted longitudinally in jumbo-size rubber blocks. This absorbs road shocks and provides constant, smooth traction and travel despite the most adverse floor conditions.

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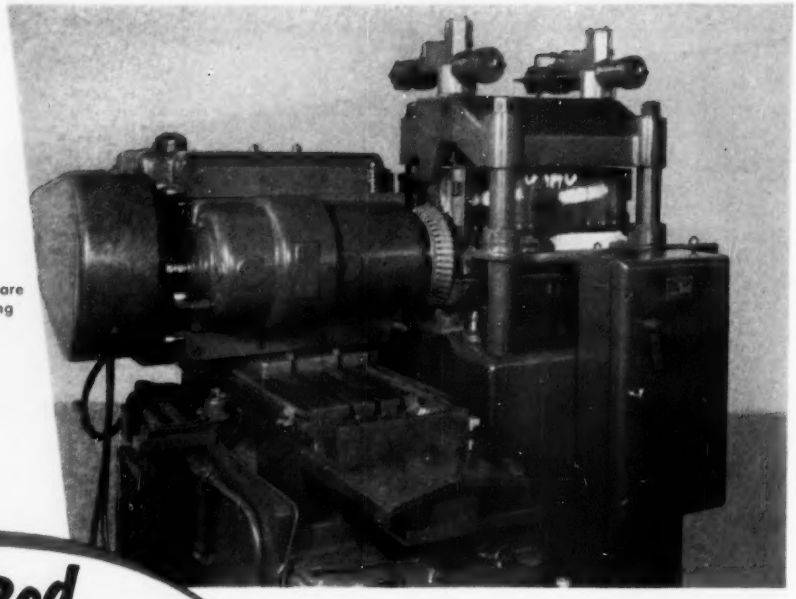
Material Handling and Construction Equipment

Baker
industrial trucks

PRODUCTION DATA:

Part Name	Cylinder block
Material	Cast iron
Operation	Mill flywheel end square with crankshaft bearing
Cutting Speed	300 feet per minute
Feed	25″ per minute
Production	30 per hour

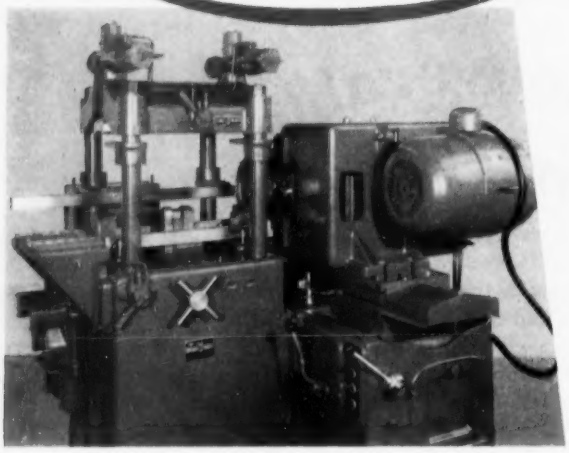
CINCINNATI



Familiar units comprise this CINCINNATI special purpose miller. In this view, a cylinder block is clamped in position for the milling operation.

Hydromatic Bed and Dial Type Head

COMBINE FORCES TO MILL CYLINDER BLOCKS



Operator's working station, showing comparative simplicity of Hydromatic and Dial Type combination.

Unorthodox procedures sometimes work out to advantage. In this example, the work and cutter spindle head have been interchanged for an accurate milling operation on cylinder blocks. A lower unit cost resulted, and here are the reasons why. ¶The machine, basically a CINCINNATI No. 3-24 Hydromatic Miller, is equipped with a spindle carrier mounted on the table, and a "dummy" headstock which incorporates a conveyor height fixture. The spindle carrier may look familiar to you . . . with minor alterations, it's the standard vertical head of a CINCINNATI No. 3 Vertical High Power Dial Type. To reduce physical effort for the operator, the fixture is pneumatically operated. A 12″ diameter sintered carbide cutter takes the cut at 25″ per minute. ¶Cincinnati Application Engineers are expert at taking standard units of CINCINNATI Milling Machines and putting them together with a minimum of special work. Whether it's a tailor-made machine or merely a special unit, you can be sure of justifying your replacement policy with CINCINNATI handling your milling problems. May we hear from you?

THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO

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Plain and Duplex styles, conventional and tracer controlled types, 18 sizes of each, 24″ to 90″ table traverse, 10 hp to 50 hp drive, standard and complementary unit construction for flexibility in building single-purpose machines.

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3—Plain Tracer Controlled Hydromatic. Catalog No. M-1602-2
4—Duplex Tracer Controlled Hydromatic. Catalog No. M-1602-2

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Rising Labor Costs Are Stumbling Block

That's what Belgian manufacturers are finding. Comparison of major European metalworking countries shows Belgium near the top in average hourly wage rates

U. S. MANUFACTURERS are not alone in feeling penalized by higher-than-average wage rates when competing for world markets.

Belgian employers, especially in the metalworking industries, are complaining about the disparity of wages in Europe. That disparity damages their competitive position, they say.

Europe's Wages — For example, the average hourly wage in Belgian industry, except for the mining industry, is about $0.65. In the Netherlands, it's about $0.38; in Great Britain, $0.58; in France, $0.53; and in Germany, $0.59.

As a result, say Belgian manufacturers, export trade of the Belgian metalworking industries dropped well below its historic percentage of 40 per cent of total output last year. In 1953 compared with 1951-52, exports to Spain, Portugal, Greece, Finland, Great Britain and Pakistan dropped about 50 per cent; exports to Russia decreased nearly 30 per cent; exports to Argentina, Brazil, Australia and New Zealand collapsed to one-tenth of their earlier proportions.

Me-Too Italy—And the Belgians aren't the only Europeans concerned with rising labor costs. The Italian manufacturer, for instance, now pays approximately 73 per cent of his total net production costs to labor, compared with 56 per cent in the immediate prewar years. Recent strikes in Italy were over worker demands which would imply an increase of 10 to 15 per cent in the cost of labor.

Much of increased costs of European labor have come through "fringe" benefits rather than direct wage increases. That has led one Belgian executive to say: "Social charges have reached a very high level and the time has come for this country (Belgium) to try to reach a balance between further social progress and economic possibilities. That will necessitate: Producing at the lowest possible cost; expanding export markets; and striving toward equalization of wages, taxes and other costs among members of the steel community (E.C.S.C.)."

For Japanese Rebuilding

Koehring Co.'s first Japanese-made 205 excavator came off the assembly line at Ishikawajima-Koehring Ltd., Yokohama, Japan, in early December, 1953. I-K equipment has been used extensively in the Japanese postwar construction program. Emphasis in the future will be on equipment made entirely in Japan from plans by Koehring and its American subsidiaries for I-K

Aluminum Plant for Spain

Construction of a new aluminum fabricating plant is well under way at Alicante, Spain, says Aluminium Ltd. of Canada.

When completed the plant will produce aluminum sheets, plates and extrusions, aluminum steel-reinforced cables for power transmission and aluminum foil. The capacity will be between 18,000 to 20,000 tons of these products a year from ingot to be supplied by the smelting subsidiaries of Aluminium Ltd.

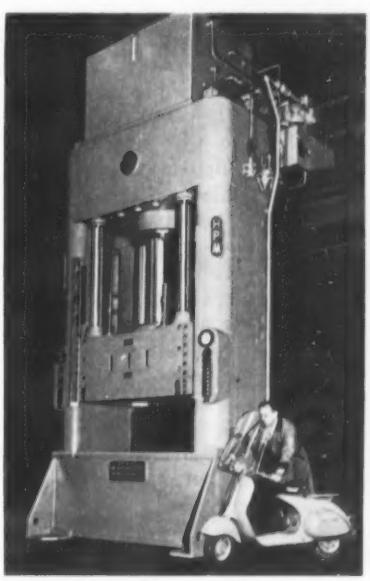
The new fabricating plant is owned by Aluminio Iberico S.A., a company controlled jointly by Aluminium Ltd., Manufacturas Metalicas Madrilenas S.A. of Madrid and a group of Spanish banks and individuals.

Spanish partners in Manufacturas Metalicas Madrilenas S.A. are planning to build a plant at an adjacent site for the construction of railway freight and passenger cars, life boats, bus bodies and ship superstructures, using aluminum alloy mill shapes fabricated by Aluminio Iberico.

Blocking European Recovery

A major obstacle in the way of genuine European recovery are the burdensome restrictions on business imposed by foreign import licenses. Import licensing has a much more deadening effect upon European economy than American tariff barriers, which are already lower than most European tariffs.

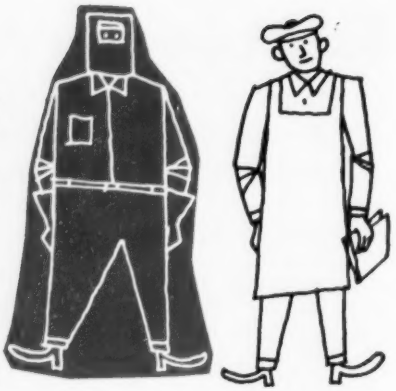
Those are the opinions of William E. Umstattd, president of Timken Roller Bearing Co., after a five-week tour of Timken's plants and sales offices in Europe.



For Italian Scooters

This hydraulic press, made by Hydraulic Press Mfg. Co., Mt. Gilead, O., was recently shipped to Piaggio & Co., Genoa, Italy. The press, together with a duplicate shipped earlier and several H-P-M die casting machines, is to be used to make Vespa scooters like the above. Press exerts 400-ton pressure on metal to be formed, has a 150-ton blankholder, 50-ton die cushion

Employee Communications ...Key to Teamwork



Unless employees are aware of management problems and the reasons for management decisions they can't see the management viewpoint. That's the reason employee communications is the fastest growing tool to increase labor-management teamwork

RECENTLY a workman went into a department of a Detroit plant with a folding rule and began to measure. When curious workers asked him what he was doing, he replied that he was measuring for new machines. The workers reported the situation to their union steward who concluded a rumor he had heard that the department was being moved to another plant was true.

Within less than half an hour the rumor had spread through the whole department and the workers were preparing to walk out in protest. Only when word of the situation reached the division superintendent was the matter cleared up. The workman was measuring for some new equipment to make work easier and increase production in the existing department. Thus the walkout was prevented, but an hour's production had been lost merely through management's failure to tell the workers of its plans.

Opportunity Missed — This is a triple-barreled example of bad employee communications. Not only did the workers not know the simple fact that the new machines were coming, but management also missed a fine opportunity to point out that the machines would actually make the job easier for the workers. And perhaps most significant of all, the workers went to the union steward for the facts rather than to the foreman or the superintendent, showing that the workers did not feel they were part of the company team.

Could a situation like that happen at your plant?

Better, But — With a rapidly growing number of companies today the answer is "no," but that position has not been reached easily. During the postwar period management spent millions to improve working conditions, provide employee benefit programs and make the worker's life as pleasant and profitable as possible. But management was shocked to learn that actions alone are not enough. Slowdowns, work stoppages, strikes and similar interruptions to production grew commonplace as the workers enforced demands for still more.

That's why management took a further look at what it takes to build teamwork. Attitude surveys were conducted by many corporations to find out what their workers really felt about their company, and the results were startling. Workers thought the company was unconcerned about their welfare and that the union was responsible for their gains. Many knew so little about the workings of the corporation that they considered their own effort on the job unimportant to the welfare of the company as a whole. Those few who did realize that extra effort was significant often felt it would only serve to make more profit for a few idle rich and could not see the benefits to themselves.

The Payoff—Changing these attitudes of indifference toward the job to production teamwork are the bailiwick of employee communications, and it's produced some striking results. General Electric

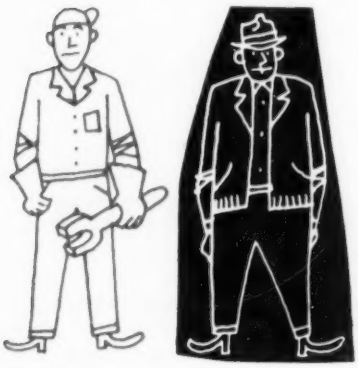
Good Communications Can:

- Help employees build the habit of looking to the company rather than the union for reliable information.
- Give employees a full understanding of the aims, objectives and plans of business and what they can do to help.
- Clarify the reasons for policies, regulations and procedures under which a group must operate.
- Weld team spirit and team thinking through the realization that management is concerned with worker opinions and problems.

Workers Want To Know:

- What do I mean to the company and what are my prospects?
- What is being done to insure my future and my security?
- Are my wages and working conditions fair?
- Are the company, its people, its products and my job something I can be proud of?

Co. cites figures in one of its divisions to show that under improved employee communications waste went down $2.50 per unit, spoilage dropped more than 2.5 defects per



unit, absenteeism was reduced almost 8 per cent, labor turnover was cut 3.5 per cent and accident frequency skidded from 33 to 6 per million man-hours worked.

That's the genesis of the new accent on employee communications, a craze which is sweeping industry much as aptitude and intelligence testing did a few years ago.

Knowing the Score—And what is employee communications? Essentially it's nothing more than leveling with labor; letting the boys on the line know the score. Its basic premise is simply that when workers know the problems of management they can and will think like management. As one EC exponent expressed it, "You wouldn't expect a football team to function well if the players on the line didn't know the rules of the game, how the signals were being called or what goal they were moving toward. Employee communications tells our people what our goals are and how they can help us all move toward them."

Of equal importance, however, is the other side of the coin—finding out what employees have on their minds and what management can do to help. The employee must feel confident that supervision has a sincere interest in him as an individual, is sympathetic with his needs and is willing to listen to what he has to say. Employee communications is a huddle for the exchange of information and while the quarterback calls the plays, the wise ones take their cues from what the men on the line have to tell them. And that's the kind of quarterback the linemen have confidence in and for whom they will do their best.

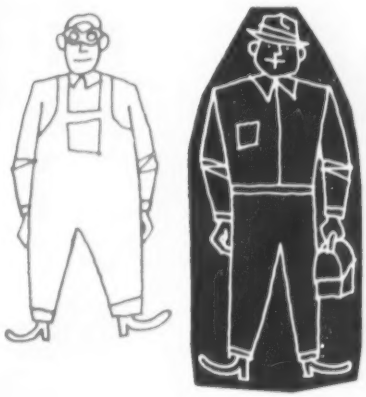
The Foreman Is the Key — Since good employee communications depends on a free interchange of information quickly and easily, the most significant area of EC is at the supervisory level. Companies

like Carboloy Division, General Electric Co., Burroughs Corp., Republic Steel Corp., Clevite Corp. and hundreds more have set up special foreman information meetings to insure that the immediate supervisor knows the answers to the questions the workers will ask. Often the foreman can pass on to management the questions, gripes and suggestions of the workers for an immediate answer.

No matter how respected the immediate supervisor may be, the employees recognize that behind him is "the company" toward which their feelings may be entirely different. A good program must therefore bring the manager before his subordinates regularly as the motivating force behind teamwork. Through him "the company" must be endowed with the qualities of friendliness, consideration, fairness and competence. Workers must be invited to participate through questions, comments and suggestions and there must be evidence that these suggestions are receiving careful and sympathetic consideration.

Sense of Belonging—Subordinates will defend the decisions and support the policies they feel they have had a part in developing. The need is to convey that feeling as well as information. Though face-to-face contact is most important, the written communications play a key role as well. Indicative is the estimate of one source that the number of printed words reaching employees has more than doubled since the end of World War II. Included are plant newspapers, newsletters, bulletin boards and information racks to name just a few.

General Motors Corp. reports that its plant newspapers ran over 5.5 million copies in 1953 while GM information racks yielded employees over 67 million copies of 365 booklets in the 59 months of their existence. The GM information racks are a particularly inter-



esting example of employee communications because not only do the employees not have to take the booklets, many of the subjects do not sound like communications with employees at all. Take one of the most popular called "Money Saving Main Dishes."

Aim of Good Will — Milton E. Mumblow, director of employee publications, explains that the response from employees' families indicates that a channel has been developed into the homes. "Such booklets help create good will for the rack program and for GM," says Mr. Mumblow, "and they help establish the habit of picking up the booklets and taking them home."

Other booklets of this type like "Vegetables in Your Home Garden," "260 Timely Tips for GM

(*Please Turn to Page* 73)

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- **N-A-X 9100** series—alloy steels for carburizing and heat treated parts.

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NATIONAL STEEL CORPORATION

From Superchargers to Tooling: SAE Delegates Hear What's New

REMEMBER SUPERCHARGERS? These whistling air pumps that literally supercharge the cylinders with more go-mixture seem marked for a return to the automotive scene, auto engineers attending the SAE annual meeting in Detroit were told last week.

Offering better power to weight, greater engine flexibility over wide speed ranges and a most timely economical means to hike horsepower without retooling extensively, the supercharger appears the answer to the independent's prayer.

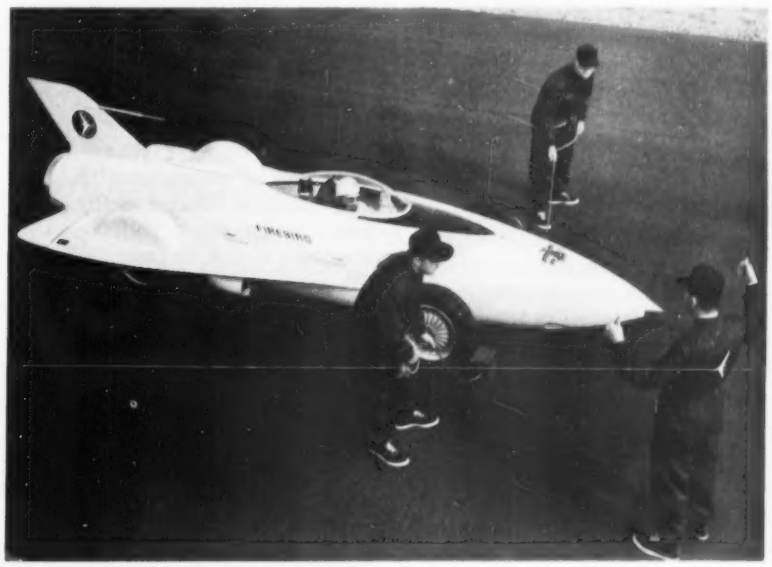
Ready, Set—Already tooled to produce 5000 of the units a month, McCulloch Motors Corp.'s John W. Gehrli says the firm expects to have many auto companies on the dotted line to factory-install the units shortly. Hiking horsepower up to 40 per cent and cutting average 0-60 mph figures from 20 to 13 seconds, the unit can be factory-installed for about $120, one spokesman estimates.

Another interesting unit on display is a differential which locks when either rear wheel loses traction on snow, ice or mud, diverting power to the wheel with traction. Consisting of three sets of four spur gears and an internal triple-threaded nut gear, relative motion of the axle shafts causes the nut gear to climb a helix and bear against a bronze plate giving a power division up to 14 to 1. The unit is already available through some Pontiac dealers in the midwest and will appear on production cars of many makes in the next few years, says its maker, Dualoc Drive Inc., Rockford, Ill.

For the Future—A closed-center hydraulic pressure system which would operate power brakes, power steering, window lifts, power seats, windshield wipers, parking brake controls, vibrator horns, top lifts, trunk and hood lifts and many other devices not even thought of may become reality. Engineers listening to the talk of George W. Lewis, Electric Auto Lite Co., agree that a central hydraulic system is coming on the passenger car. Among the advantages cited for such a system by Mr. Lewis are: Elimination of complexity inherent in the growth of independent hydraulic devices in cars today, a supply of oil available under pressure for some time even after the engine has stopped and a high momentary available rate of discharge.

Of heightened significance as competition stiffens are cost cutters in materials, methods and manufacture which came in for heavy attention at the meeting. W. H. Seacord and F. L. Helmel of International Harvester Co.'s Mechanical Engineering Research Division cited the benefits of statistical control methods as applied to cutting tools. Through analysis of statistical data obtained from tool performance based on stock removed per thousandth of cutting tool used, a $30,000 annual saving on gear hobs alone is being realized at one of the firm's plants.

Gearing — In an engineering evaluation of gear manufacturing processes, William E. Gustin and D. C. Smiley of Deere Mfg. Co.'s Waterloo, Iowa, tractor works point out that different gears within the same unit may require different properties. Summarizing their findings, they report that induction hardened 1050 steel with a 500° F temper produces a strong, impact-resistant gear for slow-speed practical, accurate measurement of field service for this type of gear. For gears subject to many millions of revolutions at rel-



Move Over, Captain Video

First reported in STEEL on May 4, 1953, the GM turbine car finally was announced some weeks after Charles McCuen's flip in the Blow Torch popped the story prematurely. The hot pipe will be on display at GM's motorama which opens this week in New York with "strictly experimental" billing to keep the wealthy from placing orders. Turbine potential for ground use is being tested

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Auto, Truck Output

U. S. and Canada

	1953	1952
January	612,815	424,559
February	623,793	464,577
March	752,474	525,024
April	782,453	570,464
May	685,390	542,559
June	713,206	542,479
July	757,595	226,134
August	641,152	322,755
September	605,228	595,715
October	651,153	656,767
November	457,852	548,782
December	528,750	569,715
Total		5,989,509

Week Ended	1953	1952
Dec. 12	113,145	121,590
Dec. 19	134,156	134,933
Dec. 26	92,247	102,558
	1954	1953
Jan. 2	93,293	106,102
Jan. 9	154,341	139,620
Jan. 16	150,000*	148,049

Source: Ward's Automotive Reports.
*Estimated by STEEL.

atively high speeds, they find carburized, air-cooled, induction-hardened and rebroached carbon steel gears offer advantages. Laboratory fatigue tests on the four-square machine can be correlated to field service with this gear.

Increasing work in the field of residual stresses is predicted by R. L. Matson, Research Laboratories Division, General Motors Corp., who notes that they are more complex and hence even more important than the relatively simple external load stresses. Citing the importance of residual stresses to the mechanical properties of parts, he points out that heat treating, grinding, machining, cold working, straightening, static loading and fatigue loading all can introduce or alter residual stresses causing premature part failure.

Mutual Aid—Jack Slean of Heidrich Tool & Die Corp., Detroit, indicates differences in tooling aircraft and automobiles which can confuse tooling shop personnel. Familiarity with both techniques offers mutual advantages, however, and he suggests that greater use of optical equipment in the automotive field is worthwhile. This method of setting and aligning details and assemblies can effect a substantial saving in automotive products, he believes, with integration of fast developing new tooling techniques offering mutual advantages to aircraft and automakers.

Nearly 100,000 tons of pearlitic malleable will be produced by the industry this year, says Carl F. Joseph, Central Foundry Division, General Motors Corp. Currently under development are automotive differential cases, air conditioning parts and many others. Mr. Joseph sees a considerable increase in production of this material in the next few years, citing mechanical properties and reduced machining time as important factors in the growth.

Corvette Story—The Chevrolet Corvette body was originally planned as a steel unit formed with Kirksite dies, says E. J. Premo of Chevrolet Motor Division. When plastic was utilized to get the initial production of 300 units during the last half of 1953, fibre glass plastic seemed to captivate the public. Further, the plastic industry indicated the practicability of fabricating plastic body parts for automobiles on a large scale, though the industry is still in its infancy. Mr. Premo reports that, "We have just scratched the surface in exploring the possibilities of reinforced plastics, and it seems certain that their development will profoundly influence future body design."

Oldsmobile for 1954

Speaking of rockets, "The Rocket 8 That Couldn't Wait" is the Olds way of saying that the new body shell it shares with Buick and presumably Cadillac this year was moved up from 1955. The job was done through plastic models and overtime tooling effort after the decision was made to go ahead a year ago last November with dramatically provident timing.

Styling is the main burner in a Rocket that Olds expects to soar sales to over 400,000 units this year. But a horsepower hike to 170 hp in the "88" series and 185 hp in the Super "88" and "98" series, a 2-inch increase in length and colors galore will add their bit to the sales pitch. A new Holiday model is added to the "88" line as well as a convertible new to the series. The Starfire becomes the convertible in the "98" line.

Exhaust Notes

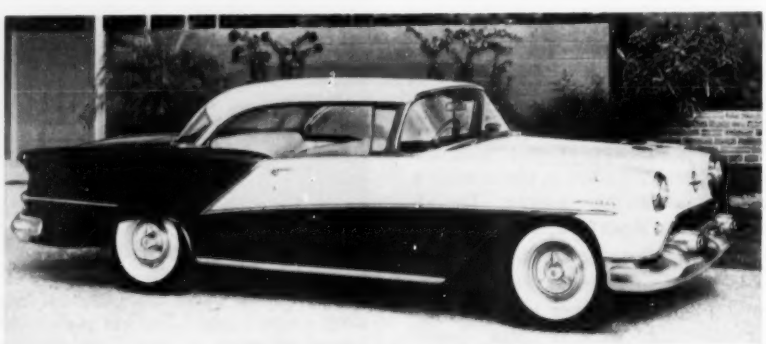
Experiments by Fisher Body reveal that a car with a black top is 15 degrees hotter parked in the sun than a car with a white top.

Chevrolet produced 315 Corvettes in 1953, topping its 300-unit goal.

Chrysler Corp. of Canada Ltd. expects to improve its sales position in the Canadian auto market when a $41-million expansion to double capacity is completed late in 1954.

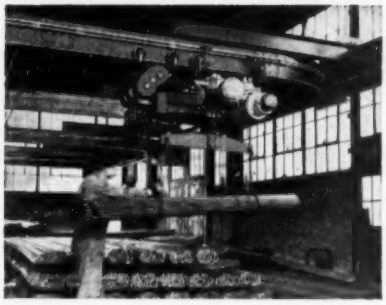
Jaguar is setting up a training school for mechanics in the U. S. in preliminary steps to establish a U. S. network of service departments manned by factory-trained mechanics. There are now more than 14,000 Jags on the nation's highways, and it looks like the Coventry crew plans to stay.

Plymouth had the greatest production year in its entire 25-year history during 1953. Production for the year totaled 661,318 cars, exceeding the previous high in 1951 when 623,031 cars were built.



OLDSMOBILE LOOK FOR 1954
. . . lower, longer and rainbow colored

MONORAIL *Pays!*

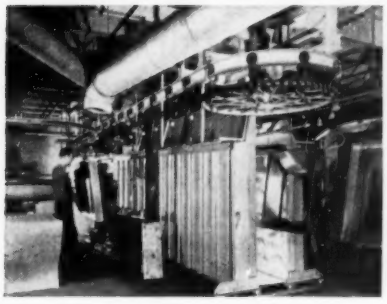


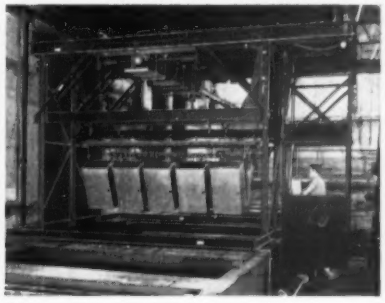
INCREASES TONNAGE

From 26 to 48 tons of steel rod per day was the increased movement produced by a properly engineered monorail system.

LOWERS COST

This simple system actually saved $150 in handling costs within four months of operation. No more sheet-by-sheet movement.





SAVES TIME

Passage, on monorail, of metal parts through infra-red dryer, cuts 70% from former drying time. All other handling in plant on monorail.

MORE CAPACITY

30% more capacity was added to metal cleaning process by handling a third more units on carrier with one man operation from cab control.

LESS LABOR

Operators claim to save 26 man hours per truck over former unloading time. Interlocking monorail cranes in the plant also reduce handling costs.

Write for Bulletin C-1
showing many more cases where MONORAIL PAYS!

THE AMERICAN MONORAIL COMPANY

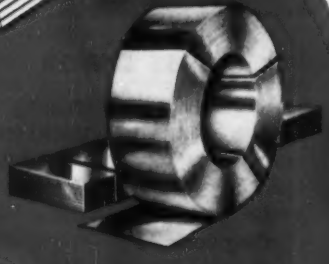
13102 ATHENS AVENUE **CLEVELAND 7, OHIO**

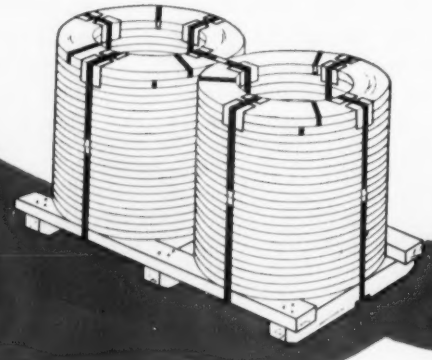
Narrow Hot Rolled Strip
Here is additional tonnage

Sharon Quality

NARROW HOT ROLLED STRIP AVAILABLE IN MANY CARBON RANGES

SHARON HOT ROLLED STRIP TONNAGE is available in good supply. This top quality narrow Hot Rolled Strip Steel, with mill edge, has a range of ½" to 3" in width. Hot Rolled Strip Steel is also available in widths up to 21½". Complete analysis range all widths 1008 to 1098 inclusive. Also alloy and high tensile grades.





Type 430 Stainless and Galvanite* Coated booklets are available from any Sharon office.

*Trade name copyrighted by the Sharon Steel Corporation

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LOS ANGELES • MONTREAL, QUE. • CINCINNATI • DAYTON • INDIANAPOLIS
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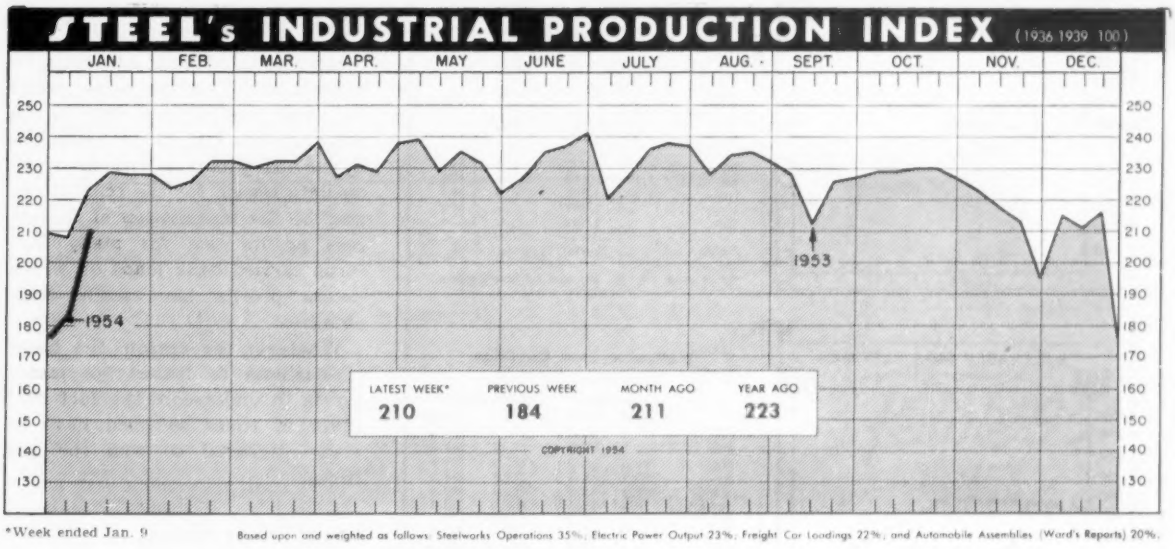


*Week ended Jan. 9

Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.

Auto Producers Hesitate on Hefty Production

DOWNWARD REVISION of passenger car output in January will make businessmen more cautious than ever. However, this change from 527,000 units to 514,000, due to Chrysler's action in taking off the second shift at Plymouth, will only slightly dent the month's industrial outturn. During the week ended Jan. 9, STEEL's industrial production index rose to a preliminary 210 per cent of the 1936-1939 average. Production was 21 percentage points above the preceding week but 13 points below the comparable week of 1953 when industrial outturn was starting a climb to record highs.

Auto Sales Slipping . . .

December's automobile dealers' sales volume, probably at the lowest point in 14 months, according to *Ward's Automotive Reports*, is not encouraging. Also, as of Dec. 20, new car stocks were only 7 per cent below the postwar high of last Sept. 30 and better than 60 per cent above early 1953 inventories.

Attesting to the mounting automobile sales made in the first half of 1953 was the number of motor vehicles registered in the U. S. As of July 1, 1953, registration of cars and trucks passed the 50-million mark for the first time, says R. L. Polk & Co. Competition last year dropped the independents' share of U. S. output to 8.8 per cent from 13.3 per cent in 1952.

Work Cuts Go Deeper . . .

Employment cutbacks continue. Nonagricultural employment in December failed to show the customary substantial seasonal increase as it remained at the November level of 55.3 million, according to figures of the Department of Commerce. Department of Labor remarks that the increase on nonfarm payrolls was the smallest monthly gain in recent years.

Unemployment rose about 400,000 above November to total 1,850,000 persons. Even so, unemployment was about as low as in any December of the postwar period except 1952, the Department of Commerce reports.

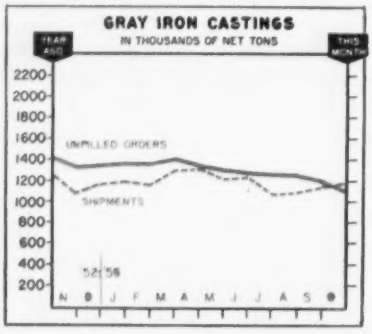
Work week of factory production workers, averaging 40.1 hours per week in December, was below the year-ago figure, but their gross hourly pay was at the all-time peak of $1.79, the Bureau of Labor Statistics says. Hourly pay increases in many industries continued to offset a reduced work week.

Income: Not as Much . . .

Personal income in November, at an annual rate of $285.5 billion, was minus a $2-billion jingle from the preceding month but still $8 billion ahead of November, 1952, according to the Office of Business Economics. Private wages and salaries bore the brunt of the decline, dropping $1.5 billion from October. And two-thirds of this sum was pared from factory payrolls.

Rush to Repay . . .

Decline in loans to business by leading New York city banks of $231 million in the week ended Jan. 6 is the largest weekly decrease on record. Largely caused by repayments of loans, unusually heavy for the time of year and somewhat early for several industry groups, the city decline helped lower the total commercial, industrial and agricultural loans at 21 U. S. banks to $8,299 million, $318 million below the same week a year ago.

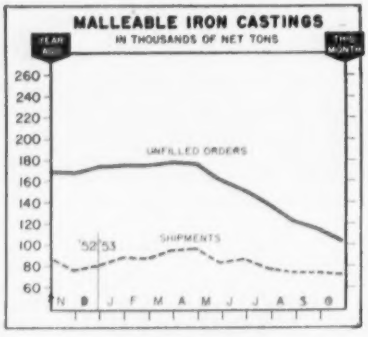


Gray Iron Castings

Thousands of Net Tons

	Shipments*		Unfilled Orders*	
	1953	1952	1953	1952
Jan.	1,162	1,199	1,333	1,801
Feb.	1,136	1,155	1,332	1,766
Mar.	1,264	1,172	1,376	1,711
Apr.	1,277	1,205	1,306	1,614
May	1,186	1,101	1,272	1,459
June	1,196	835	1,246	1,445
July	1,056	636	1,233	1,410
Aug.	1,069	1,002	1,223	1,513
Sept.	1,106	1,119	1,170	1,451
Oct.	1,142	1,233	1,076	1,392
Nov.	....	....	1,061	1,309
Dec.	....	....	1,142	1,316
Total	...	....	13,660	

*For sale. U. S. Bureau of the Census.

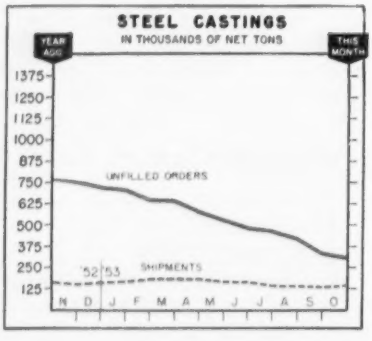


Malleable Iron Castings

Thousands of Net Tons

	Shipments		Unfilled Orders*	
	1953	1952	1953	1952
Jan.	87.2	87.0	174.8	203.0
Feb.	86.5	82.9	175.1	193.1
Mar.	94.5	81.0	177.8	196.9
Apr.	95.9	89.3	174.5	198.2
May	82.1	81.8	160.4	180.4
June	86.5	74.4	151.0	173.4
July	77.1	45.3	137.3	166.6
Aug.	73.9	63.7	120.8	162.8
Sept.	74.3	75.9	114.5	168.4
Oct.	73.5	88.1	104.0	168.6
Nov.	...	76.1	....	167.8
Dec.	...	80.6	....	173.5
Total	...	926.1		

*For sale. U. S. Bureau of the Census.

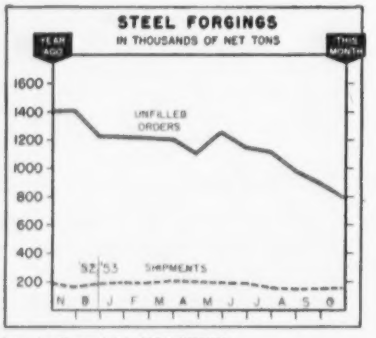


Steel Castings

Thousands of Net Tons

	Shipments		Unfilled Orders*	
	1953	1952	1953	1952
Jan.	167.2	193.7	706.5	869.3
Feb.	175.7	174.6	644.3	856.9
Mar.	182.2	173.7	634.6	857.1
Apr.	179.6	175.1	573.6	843.0
May	165.6	173.6	525.0	804.7
June	164.7	141.6	475.8	846.5
July	139.6	119.0	467.9	855.0
Aug.	141.3	150.2	418.9	809.4
Sept.	135.3	158.4	327.2	781.9
Oct.	140.7	165.2	304.1	772.9
Nov.	...	148.3	....	751.7
Dec.	...	161.7	....	719.2
Total	..	1,925.1		

*For sale. U. S. Bureau of the Census.



Steel Forgings*

Thousands of Net Tons

	Shipments		Unfilled Orders	
	1953	1952	1953	1952
Jan.	184	271	1,207	1,472
Feb.	184	277	1,199	1,464
Mar.	200	266	1,197	1,360
Apr.	196	277	1,082	1,349
May	191	263	1,239	1,319
June	185	224	1,135	1,248
July	155	132	1,081	1,290
Aug.	151	121	974	1,399
Sept.	153	150	882	1,392
Oct.	156	178	798	1,393
Nov.	...	156	....	1,399
Dec.	...	181	....	1,377

U. S. Bureau of the Census. *Data based on reports from commercial and captive forge plants with monthly shipments of 50 tons or more.

Charts Copyright 1954 STEEL.

Issue Dates on other FACTS and FIGURES Published by STEEL

Construction .....Dec. 28	Gears .....Dec. 21	Ranges, Elec. .....Nov. 2
Durable Goods ....Dec. 14	Indus. Production..Nov. 23	Ranges, Gas .....Jan. 11
Employ., Metalwk..Nov. 30	Ironers .....Nov. 23	Refrigerators .....Nov. 2
Employ. Steel .....Nov. 30	Machine Tools ....Dec. 7	Steel Shipments ...Jan. 11
Fab. Struc. Steel ..Dec. 21	Prices, Consumer ..Dec. 7	Vacuum Cleaners ..Jan. 11
Foundry Equip. ...Dec. 21	Prices, Wholesale..Nov. 30	Wages, Metalwk. ..Dec. 28
Freight Cars .....Dec. 28	Pumps .....Nov. 16	Washers .....Dec. 21
Furnaces, Indus. ..Dec. 7	Radio, TV .....Dec. 28	Water Heaters ....Jan. 11

according to Federal Reserve Bank reports.

"Be Prepared" . . .

Expansion of bank clearings to $18,953,309, 12.2 per cent above the same week a year ago, in the week ended Jan. 6, is explained by the heavy loan repayments. Immediate reason for the repayments may be the termination of the excess profits tax, for many concerns carried bank loans on which excess profits tax credits were obtained.

Whatever the reason, the haste of business to make repayments serves to underscore the fact that never in times so good have so many prepared so well for bad times.

Lower Prices Ahead . . .

Slightly lower commodity and consumer prices also are in the offing. During the week ended Jan. 5, in the spot market index for all commodities of the Bureau of Labor Statistics, all groups showed declines from the preceding week with the exception of raw industrials and textiles and fibers. In November the consumer price index of the National Industrial Conference Board declined slightly again for the second consecutive time.

Inventory Drop Continues . . .

Even with inventories near the all-time high, prices will not be greatly affected unless the business decline becomes much sharper or considerably deeper. During November when all business inventories totaled $79.2 billion, according to the Office of Business Economics, stocks declined physically from the preceding month and also seasonally for the second consecutive month. Manufacturers' and wholesalers' stocks were down, but retail stocks rose from the preceding month.

On a seasonally adjusted basis the manufacturing inventory reduction amounted to $200 million, the wholesale decline to about $100 million. Unusual is the fact that the manufacturing decrease was entirely in nondurables. The entire drop in durable goods at the wholesale level is most wel-

BAROMETERS OF BUSINESS

	LATEST PERIOD	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	75.0	71.5	98.0
Electric Power Distributed (million kwhr)	8,825	8,200	8,210
Bitum. Coal Output (daily av.—1000 tons)	1,158	1,086	1,288
Petroleum Production (daily av.—1000 bbls)	6,195[1]	6,234	6,516
Construction Volume (ENR—millions)	$225.9	$153.2	$185.0
Automobile, Truck Output (Ward's—units)	154,341	93,293	139,620
TRADE			
Freight Car Loadings (unit—1000 cars)	600[1]	478	688
Business Failures (Dun & Bradstreet, no.)	202	150	163
Currency in Circulation (millions)[3]	$30,591	$31,009	$30,153
Dept. Store Sales (changes from year ago)[3]	+1%	+12%	+5%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$18,953	$15,285	$16,896
Federal Gross Debt (billions)	$275.2	$ n.a.	$267.4
Bond Volume, NYSE (millions)	$16.7	$12.5	$19.6
Stocks Sales, NYSE (thousands of shares)	7,083	8,263	9,845
Loans and investments (billions)[4]	$81.3	$80.9	$78.5
U. S. Gov't Obligations Held (billions)[4]	$32.8	$32.7	$32.5
PRICES			
STEEL's Finished Steel Price Index[5]	205.5	205.5	216.0
STEEL's Nonferrous Metal Price Index[6]	110.4	110.6	109.9
All Commodities[7]	114.5	114.5	113.1
Commodities Other Than Farm & Foods[7]	189.74	189.74	181.31

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1954, 2,384,549; 1953, 2,254,459. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100. n.a.=not available.

come. At the retail level stocks of durable and nondurable goods dropped when adjusted for the time of year.

Sales Slide at Same Time . . .

Business sales in November of $47.4 billion were down from the preceding month, the Office of Business Economics says. Total sales drop of $250 million, seasonally adjusted, does not explain the inventory reduction. It is explained by faster shipments and a further decline in unfilled orders.

Retail Sales Rising . . .

Favorable recent development is the slight over-the-year increase in both all retail and department store sales during the latest weeks. Retail increase in the week ended Jan. 6 is estimated to be from 1 to 5 per cent larger than a year ago by Dun & Bradstreet. In the week ended Jan. 2, department store sales were 1 per cent above a year ago, reports the Federal Reserve Bank. In the four weeks ended Jan. 9, for which total figures are not yet available, department store sales in the Philadelphia area were 5 per cent above the comparable period last year. Philadelphia sales in the week ended Jan. 9 were only able to hold to the same 5 per cent gain.

Carloadings Plummet . . .

It is hoped that the gloomy picture of economic prospects painted by railroad freight carloadings in the week ended Jan. 2 will be blotted out. During that week loadings were 15.1 per cent below the comparable 1953 week. Largest numerical loss was in miscellaneous freight loadings. The decline in coke loading was the greatest percentagewise. Regional shippers advisory board's forecast a national decline of only 1.4 per cent for the first quarter of 1954.

Trends Fore and Aft . . .

Machine tool orders in November stood at 148.3 per cent of the 1945-1947 average, lowest since start of the Korean War, National Machine Tool Builders Association says. . . . Expansion of electric power industries should increase sales of transformer this year above the peak reached last year . . . New order index for industrial machinery and supplies of the American Supply & Machinery Manufacturers Association Inc. declined for the second consecutive month.

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ENDURO
STAINLESS SHEETS

No need for you to carry a big inventory of stainless sheets, let Kenilworth make that investment—it's easier on your working capital and you can get the quick delivery and service you need at no extra cost. Since Kenilworth can supply you with Republic-ENDURO stainless sheets in just the type you need, it makes even more sense to rely on Kenilworth. Write or phone today, a Kenilworth salesman will gladly assist you in arranging a delivery schedule.

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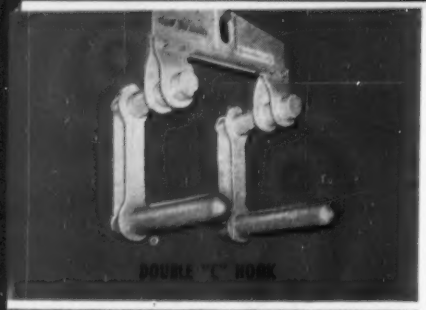

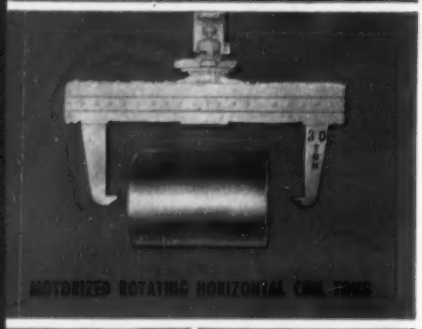

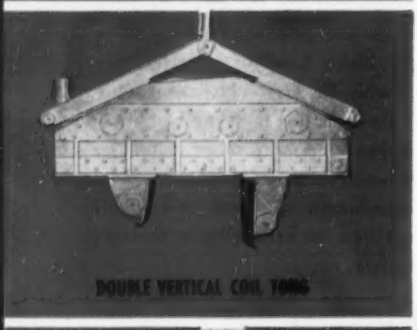

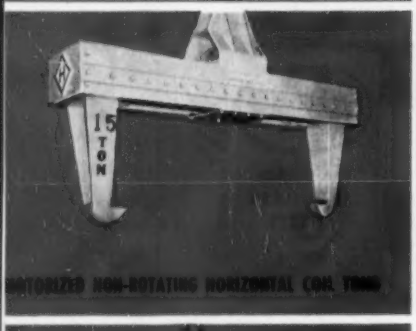

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AUTOMATIC AND MOTORIZED

SAFE-T-TONGS

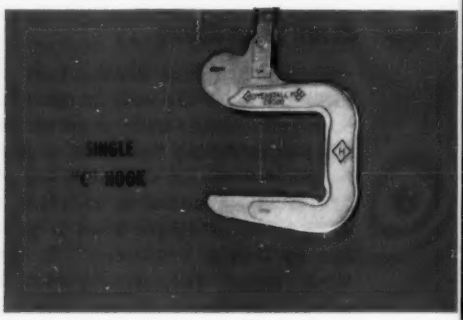
Coil handling problems differ from one plant to another. And Heppenstall's Safe-T-Tongs are designed to fit each set of specific requirements . . . *yours* for instance.

Heppenstall's Safe-T-Tongs (for coils) are lifting steel strip weighing up to 35 tons per coil—safely and economically. They are designed to lift coils vertically or horizontally—or grasp coils circumferentially as required.

Heppenstall Safe-T-Tongs for coil handling jobs have stepped up efficiency—lowered overall costs—decreased damage to coils—and improved safety conditions in plant after plant. They'll do the same for you.

Our engineers would like to work with you in designing tongs to meet *your* specific requirements. Write us today.

You'll want this new catalog. It contains solutions to many materials handling problems. We'll be pleased to send you a copy. Address: Heppenstall Company, Pittsburgh 1, Pa.



Heppenstall

. . . tongs for every lifting problem

HERBERT A. LONG
. . . Pittsburgh Steel chief engineer

L. J. JOHNSON
. . . Mathews Conveyer gen. sales mgr.

ELDRED P. CODLING
. . . chief engineer for Hoover div.

Pittsburgh Steel Co. appointed **Herbert A. Long** chief engineer. Formerly chief engineer at the Allenport, Pa., Works, he now has full supervision over engineering at the Allenport Works, the Monessen, Pa., plant and the Thomas Strip Division at Warren, O. **Donald C. Duvall** was appointed works manager at the Monessen plant and **Clarence M. Feehan** was promoted to superintendent of the Monessen open-hearth department. Mr. Duvall succeeds **Col. William J. Huston,** retiring, and Mr. Feehan succeeds **Karl Leinberger,** also retiring. The promotions were effective Jan. 1. The retirements will take effect Feb. 1.

G. H. Hille is now director of purchases for **Salem-Brosius Inc.,** Pittsburgh. He has headquarters at the general offices in Salem, O. Mr. Hille was formerly with the purchasing division of Ladish Co.

Frank A. Burns was transferred from Los Angeles to Morrisville, Pa., as public relations representative at **U. S. Steel Corp's** Fairless Works. He is succeeded as director of the Pacific-Southwest public relations district for the corporation by **Joseph H. Jordan. George C. Zeller** succeeds Mr. Jordan as public relations director at Duluth for the Northwest district where **Al Wilson** will be assistant director.

Mathews Conveyer Co., Ellwood City, Pa., appointed **L. J. Johnson** general sales manager. He managed the field engineering office in New York for several years and recently returned to the home office as assistant sales manager.

Edgar G. Seybold was elected president, **Hendey Machine Co. Inc.,** Torrington, Conn. He joined the firm in 1937 as vice president and director and for the last year has served as executive vice president. As president he succeeds **David Ayr,** retired. Other elections include **F. W. Richmond** as chairman of the board, **Helge G. Hoglund** as vice president-sales, **Bernard Sassen** as vice president-engineering, **Arthur D. Patterson** as secretary-treasurer and **Earl Betz,** assistant treasurer.

Hewitt-Robins Inc. appointed **F. L. Griffith Jr.** to the newly created post of general sales manager, rubber and conveyors divisions, with headquarters in Stamford, Conn., and **F. W. Blanchard** to the newly created post of manager of operations, industrial rubber division, Buffalo.

Ludlow Valve & Mfg. Co., Troy, N. Y., elected **John Ireland** vice president and treasurer. He succeeds **Alfred W. Thompson,** who retires as chairman of the executive committee and as treasurer.

Hoover Co., North Canton, O., appointed **Eldred P. Codling** chief engineer of its electric motor division. Long associated with the electric motor industry, he has held positions with Westinghouse Corp., Delco Products Division, General Motors Corp., and Jack & Heintz Inc.

W. J. Holliday & Co., Indianapolis, elected **G. L. Stewart** vice president and general manager. **Jennings R. Lambeth** was made manager of the Hammond plant operation, and **Lester Moreland** succeeds **C. E. Bateman,** retired, as secretary. **W. R. Mundy** is now manager of steel sales at the Indianapolis plant.

V. O. Lowry was made vice president-operations of **Greenville Steel Car Co.,** Greenville, Pa.

David W. Thomas, previously assistant general manager-sales, Jones & Laughlin Steel Corp., joined **Benjamin Wolff & Co.,** Melrose Park, Ill., as assistant to the president.

A. B. Greene was made manager of sales, reinforcing products, at **Republic Steel Corp.'s** Truscon Steel Division at Youngstown. He succeeds the late **C. L. Spatholt.** Also at Youngstown **Wayne R. Woolley** was made highway products engineer. At the corporation's alloy

HARRY L. LEYDA
. . . Lone Star mgr., steel plate sales

WILLIAM E. HILL
. . . new president, Hill Chase Steel

steel division, Massillon, O., **Sam A. Seckler** was made an assistant manager of sales.

Harry L. Leyda, a 38-year veteran of the steel industry, was appointed manager of the steel plate sales for **Lone Star Steel Co.,** Dallas.

American Manganese Steel Division, American Brake Shoe Co., named **John Brandenburg** vice president-sales, located at the Chicago office; **William E. Crocombe Jr.** central sales manager, located at the Chicago Hts., Ill., plant; and **John H. Baker** St. Louis district sales manager.

R. E. O'Neill was appointed general manager of sales at **Atlantic Steel Co.,** Atlanta. He replaces **C. F. Williams,** now sales development engineer. **R. H. Porter** is traffic manager.

Kenneth E. Jenkins was named to the newly created position of industrial hydraulics division sales manager for **Parker Appliance Co.,** Cleveland. He was formerly in the industrial sales division of Vickers Inc.

H. W. Butterworth & Sons Co., Bethayres, Pa., appointed **Ralph W. Bye Jr.** purchasing agent.

Peterson Steels Inc., Union, N. J., appointed **Richard P. Libby** sales representative in the Chicago territory and **Louis P. Costanzo** in the New England territory.

Hill Chase Steel Co. of Maryland, Baltimore, elected **John J. Hill Jr.** chairman of the board, **William E. Hill** president-treasurer, **J. J. Hill III** vice president and **Robert M. Finley** vice president-secretary.

William J. Klein, manager, Minneapolis branch, tractor division, **Allis-Chalmers Mfg. Co.,** was named vice president and general sales manager, tractor division.

National Screw & Mfg. Co., Cleveland, appointed **Laurence L. Hurd** and **Boyd D. Herrin** to newly created executive sales positions. Mr. Hurd, formerly with Buffalo Bolt Co., was named eastern division sales manager with headquarters at Buffalo. Mr. Herrin, for five years salesman with National's Kansas City office, was made western division sales manager with headquarters at Chicago.

Earl E. Gray, vice president-secretary, was elected executive vice president, **Caspers Tin Plate Co.,** Chicago. Other elections include **John P. Blake** as vice president-manufacturing, **William H. Hugus** vice president-sales, **Robert L. Singley** vice president of Closure Lithographing Corp., a subsidiary, and **Harold W. Cochran** as sales manager. **L. J. Hitchings,** vice president and treasurer for many years, has retired.

Added to the metallurgical staff at Melrose Park, Ill., plant of **Lindberg Steel Treating Co.** are **Muhammad Abdur Rashid** and **Carl Meinhard.** Mr. Meinhard will serve on the staff of Ed Pavesic, director of research.

J. M. Weldon was transferred to the general sales department of **International Nickel Co. Inc.,** New York, as assistant to the vice president. Other appointments include **C. J. Bianowicz** as manager of Inco nickel alloys department and **Daniel W. Machon** to head the newly established cobalt section of the nickel sales department. Mr. Bianowicz succeeds the late **H. D. Tietz.**

J. G. Rayburn, merchandising director, **Lamson & Sessions Co.,** Cleveland, was made assistant general sales manager. **Robert G. Patterson Jr.** was made advertising and sales promotion manager.

Gardiner G. Greene was elected president, **Browning Laboratories Inc.,** Winchester, Mass. **Dr. Glenn H. Browning,** former president, becomes chairman of the board, continuing in an advisory capacity.

James F. McNamara was elected chairman and president of **Alox Corp.,** New York, following the recent purchase of control of Alox by Surpass Petroleum Ltd., Toronto, Ont., of which Mr. McNamara is chairman. He resigned Dec. 31 as a vice president of International Nickel Co. Inc., with which he continues as a consultant. Associated with that company for over 42 years, he had been a vice president since 1947. He also serves as a director of Lukens Steel Co.

William C. Etheredge was appointed assistant director, price division, **United States Steel Corp.,** Pittsburgh. Before joining the price division in 1951, Mr. Etheredge was general staff manager, U. S. Steel Supply Division, Chicago.

Robert S. Beckham was appointed vice president in charge of distribution, **Multi-Amp Corp.,** Harrison, N. J.

At **Wheeling Corrugating Co., Emil A. Johnson** and **A. C. Barackman** have retired. Mr. Johnson was manager of the Minneapolis branch and is succeeded by **Neil H. Cheek.** Mr. Barackman managed the Detroit branch where he is replaced

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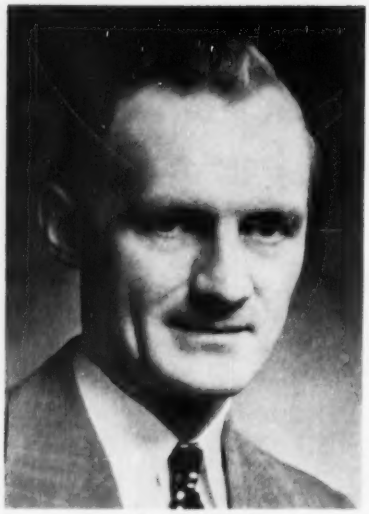

JOHN E. BRENNAN
. . . assigned Chrysler's automotive body div.

DAN D. FELSKE
. . . Gear Grinding Machine v. p.-sales

CHARLES A. HALL
. . . Cleveland Hardware & Forging post

by **Walter C. Gemperline.** At Atlanta, **P. T. Murkett** replaces Mr. Gemperline as manager.

John E. Brennan was named general manager of **Chrysler Corp.'s** newly formed automotive body division, Detroit. Since July, 1951, he has been general manager of Chrysler's jet engine plant near Detroit, and since August has also served on the over-all Dodge Division executive staff of W. C. Newberg, president, and F. J. Lamborn, vice president-general manager. **James F. Lovett** was made defense contract administrator for the corporation.

W. E. Tromanhauser, formerly vice president-general sales manager, was elected president and a director of **Buffalo Fire Appliance Corp.,** Buffalo.

Robert Ebersole was elected executive vice president and general manager, **Chisholm, Boyd & White Co.,** Chicago. He also was elected to the board of directors to succeed **Harry H. Benjamin,** resigned.

Dan D. Felske was appointed vice president in charge of sales over all divisions of **Gear Grinding Machine Co.,** Detroit. He has been with the firm for the last 33 years, serving in sales, management and manufacturing capacities.

Canadian Car & Foundry Co. Ltd., Montreal, Que., elected **K. S. Howard** vice president in charge of the steel foundry; **E. W. Johnson** vice president-sales for railway car equipment; and **G. G. Walsh** assistant vice president in charge of industrial relations.

Frederick J. Kenline was promoted to chief engineer, **Lake Erie Engineering Corp.,** Buffalo.

R. L. Griffin, senior vice president, **W. A. Case & Son Mfg. Co.,** Buffalo, retired after 50 years with the company. He will serve in an advisory capacity.

Cleveland Hardware & Forging Co., Cleveland, promoted **Charles A. Hall** to sales manager, service department. He continues as secretary. He has been in the sales department since leaving the War Production Board, Washington, in 1945.

Hy-Pro Tool Co. appointed **William A. Carlson** as its direct factory representative in western New York and northern Pennsylvania. He will have headquarters in Rochester, N. Y.

Howard C. Foster transfers to the Clifton, N. J., branch office of **Gisholt Machine Co.** He has been in the Madison, Wis., office, serving in machine service and engineering estimating.

Erwin Vogelsang is now with **Nathan Trotter & Co.,** New York. He recently retired as director of NPA's Miscellaneous Metals & Minerals Division.

N. F. Adamson, vice president-sales, was elected to the board of directors of **Twin Disc Clutch Co.,** Racine, Wis. He replaces the late **Grover C. Weyland.**

Richard C. Carmean was added to the sales engineering staff of **Cambridge Wire Cloth Co.** He will assist in sales and service in the Ohio, Michigan and eastern Indiana territory.

Firth Sterling Inc., Pittsburgh, appointed **John E. Hartman** assistant to the sales promotion manager.

Seymour Mfg. Co., Seymour, Conn., appointed **Oliver W. Mitchell** sales manager. He recently served as district sales manager at Pittsburgh for American Brass Co.

Robert Diefendorf was made controller and assistant treasurer, **Aluminum Industries Inc.,** Cincinnati.

Robert W. O'Neal is now associated with **Rees Machinery Co. Inc.,** Pittsburgh, as a sales engineer. He was employed by Follansbee Steel Corp. as chief industrial engineer.

A. G. Ricketts, supervisor of the sales order department of **Rockwell Mfg. Co.'s** Nordstrom Valve Division, was transferred to the company's Oakland, Calif., plant. In his new position he will co-ordinate joint sales planning between the Pittsburgh and Oakland plants.

Appointments at the Passaic, N. J., plant of **Raybestos-Manhattan Inc's** Manhattan Rubber Division include: **C. P. McHugh,** manager of the roll and tank departments, now assistant director of research and product design; **S. F. Horesta,** as-

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STAINLESS STEEL

- ☐ Sheets
- ☐ Plates
- ☐ Bars
- ☐ Shapes
- ☐ Pipe
- ☐ Tubing
- ☐ Fastenings—Stainless and Non-Ferrous
- ☐ Fittings
- ☐ Welding Rod
- ☐ Rigidized Metal
- ☐ Expanded Metal
- ☐ Special Shapes (flame cut from stainless plate)

CARBON STEEL

Hot Rolled Items:

- ☐ Sheets
- ☐ Floor Plate
- ☐ Plates
- ☐ Special Shapes (flame cut from carbon steel plate)
- ☐ Bars
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DAN C. SWANDER JR.
. . . Columbian Vise & Mfg. exec. v. p.

GLENN H. FRIEDT JR.
. . . executive promotion at United Platers

E. B. CONLEY
. . . Allied Engineering v. p.-gen. mgr.

sistant manager, promoted to manager of the roll and tank departments; and **E. D. Hines,** sales engineer in the tank department, now assistant manager.

Dan C. Swander Jr. was elected executive vice president, **Columbian Vise & Mfg. Co.**, Cleveland. He was made vice president-sales in 1947 and combines the duties of that position with his new overall responsibilities.

Louis Wozar was elected president-general manager, **Dayton Pump & Mfg. Co.**, Dayton, O. He succeeds **Frank M. Tait,** now chairman of the board.

Don O. Wood, executive vice president-general manager, **Fyr-Fyter Co.**, Dayton, O., since 1949, was elected president and a director.

James M. Ireland was made manager of the production engineering department, **W. L. Maxson Corp.**, Old Forge, Pa. **Milton Jennis** was named manager, methods engineering department.

Glenn H. Friedt Jr. was promoted to vice president and assistant general manager of **United Platers Inc.**, Detroit. He was formerly assistant to the president.

William R. Hummel, executive engineer, was promoted to chief engineer, **Trailmobile Inc.**, Cincinnati. He succeeds **James J. Black,** now vice president for engineering.

George M. Foose, office manager, and **W. R. Frantz,** salesman in the Chicago district office of **Bethlehem Steel Co.**, have retired.

E. H. Mann was made general sales manager, **Alloy Metal Wire Co.**, Prospect Park, Pa., a division of H. K. Porter Co. Inc.

Earl E. Chamberlain was appointed plant manager, **Norris-Thermador Corp.'s** Riverbank, Calif., ordnance plant.

Clarke A. Silcott was elected vice president, **Hupp Corp.** He will direct the operations at Detroit of Hupp and of its subsidiary, AM-gears Inc.

E. B. Conley was elected vice president and general manager of **Allied International Inc.'s** manufacturing plant, known as Allied Engineering Division. Before joining Allied Mr. Conley was with Electric Specialty Co. for 30 years.

Vernon N. Ferguson was promoted to assistant factory manager at the Dallas plant of **Temco Aircraft Corp.** He is succeeded by **William N. Rathbun** as chief industrial engineer.

Lee A. Lambing, former general superintendent of **Jones & Laughlin Steel Corp.'s** Pittsburgh Works, retired. Prior to his retirement he was staff specialist-steelmaking in the office of the vice president of production.

Fred W. Koehler was named manager of **American Welding & Mfg. Co.'s** production control department at Warren, O.

Kenneth A. Ayers is now district manager at Washington for **Baldwin-Lima-Hamilton Corp.**

OBITUARIES...

J. Howard Smart, 50, president-secretary, **Tuttle & Bailey Inc.**, New Britain, Conn., died Jan. 2.

Walter R. Ruston, 43, secretary-treasurer, **Leckenby Structural Steel Co.**, Seattle, died Dec. 27.

Emory Landon, vice president, **Seaboard Steel & Iron Corp.**, Baltimore, died recently.

Patrick Dwyer, 78, engineering editor of *Foundry Magazine,* Cleveland, sister publication of STEEL, died Jan. 9. He joined the Penton publication in 1919 and was active up to his recent illness.

Theodore Salow Sr., 76, retired president, **Spincraft Inc.**, Milwaukee, died Jan. 4.

Alexander Dawson, 72, who retired six years ago as director and general manager, **Toronto Iron Works,** Toronto, Ont., died Dec. 30.

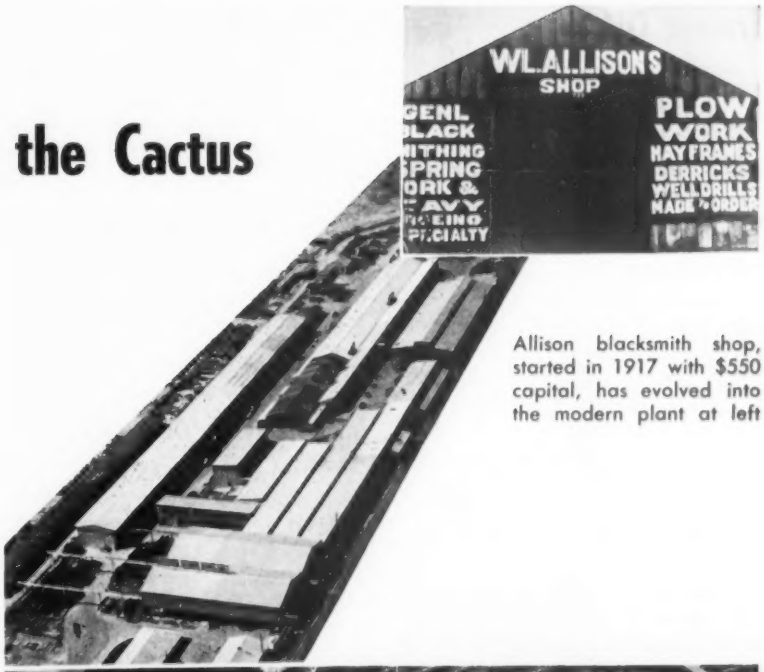
Howard E. Christie, 62, founder and president, **Christie Plating Co.**, Groton, Conn., died Jan. 3.

Steel Among the Cactus

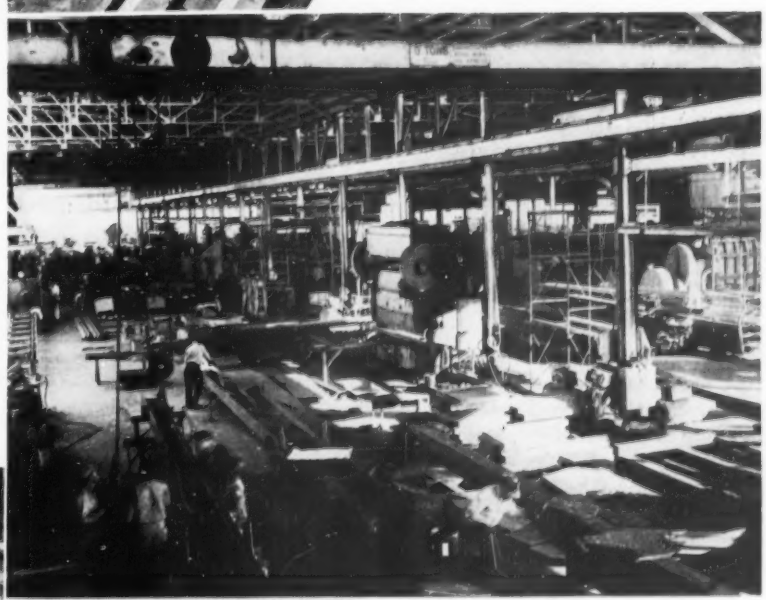
IN 1917 no one would have predicted any substantial growth for the blacksmith shop founded by William L. Allison in Phoenix, Ariz., in that year. Yet today Allison Steel Mfg. Co. of Phoenix claims to be the largest steel fabricating plant between Los Angeles and Fort Worth, the Mexican border and Denver, and employs between 500 and 900 workers.

Allison's growth story is a typical saga of American enterprise. In the early days bad roads to Arizona's scattered mines broke a lot of wagon springs. Allison's blacksmith shop repaired them, forged close ties with the mines which turned to Allison for other metal work.

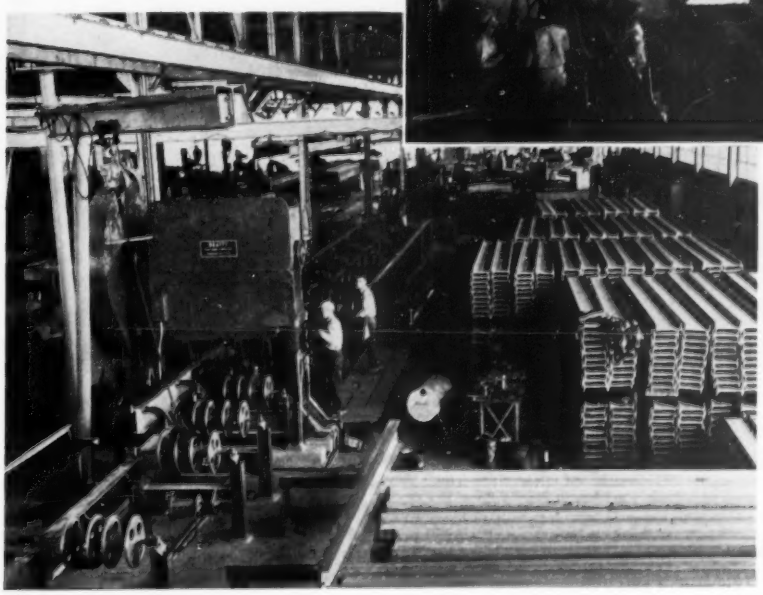
Versatility of the early blacksmith shop characterizes the business of the modern 35-acre plant. Allison now fabricates water storage tanks, dozer blades, structural steel, grain storage bins, bridges, truck bodies, conveyors, mine cars, cattle guards, radio towers and church steeples. Only the wagon spring business is a little light these days.



Allison blacksmith shop, started in 1917 with $550 capital, has evolved into the modern plant at left



Typical structural steel fabrication scene in Allison's structural shop



Beatty punch with duplicating table in Allison's structural shop bay is used for processing columns and beams

Truscon Offers New Item

Develops insulated porcelain steel panels to replace masonry walls in buildings

REPUBLIC STEEL CORP.'S Truscon Steel Division, Youngstown, has developed prefabricated, insulated porcelain steel panels to replace masonry outer walls.

Truscon already has several million dollars worth of orders for the panels, including $1.5 million worth for ten hospitals being built for the United Mine Workers. It also has a $250,000 order for panels for a men's dormitory at Clemson College, Clemson, N. C.; panels for United Air Lines' new administration building in Chicago and other structures.

Meets Need—Truscon developed the panels at the request of architects who were designing the new hospitals for United Mine Workers and who were seeking new materials. The panels are two porcelain-enameled steel sheets, with an insulating layer of fiber glass and with Truscon steel windows and ventilators set in.

The panels are prefabricated and may be easily erected on the site, regardless of weather conditions, says C. B. McGehee, general manager of sales. The panels are competitive with masonry, are 2 to 2½ in. in thickness compared with a foot thickness for masonry walls. Therefore, they save space in a building and make it possible to design the foundations and framework lighter. The panels may be made of stainless steel, or the window sash may be hot-dip galvanized, if the customer desires.

Mr. McGehee said one customer found in designing a school building that he could gain so much floor space by substituting the panels for masonry that he had to redesign the whole building. The porcelain-enameled steel sheets already have been widely used and accepted for building construction.

Allis-Chalmers To Expand

Allis-Chalmers Mfg. Co., Milwaukee, will enlarge manufacturing facilities at its Terre Haute, Ind., Works. The additional 84,000 sq ft will be used to manufacture component parts for transformers, switchgear and circuit breakers, the majority of which are presently subcontracted. Extensive tooling will be necessary and will account for the major part of an expenditure of $4,250,000 for tools, equipment and building.

Walker Wire Changes Name

Walker Wire Co., Ferndale, Mich., changed its name to Walker Wire & Steel Co. The company has added several new lines of steel items.

Moves Dayton, O., Office

Donald B. Huntting Co., Cincinnati, representative of E. Horton & Son Co.'s Horton Chuck Division, Windsor Locks, Conn., manufacturer of lathe chucks and chuck jaws, opened an office at 1904 Brown St., Dayton, O.

Whitney Chain Builds in South

Whitney Chain Co., Hartford, Conn., is erecting a warehouse building at 554 Deering Road, N.W., Atlanta. Stocks of power transmission and conveying chains, sprockets and flexible couplings will be carried. Glenn E. Tinsley is district manager in charge of the warehouse.

Magnesium Co. Names Agent

Magnesium Co. of America, East Chicago, Ind., appointed F. E. Bennett Co., Portland, Oreg., as representative in that territory to handle its magnesium materials handling products.

Fruehauf Opens Eastern Plant

Fruehauf Trailer Co., Detroit, opened a manufacturing plant in Westfield, Mass. The firm will use it as the production center for its aluminum trailers for eastern seaboard commercial business.

Hartford Firm Buys Foundry

Control of Ductile Iron Foundry Inc., Stratford, Conn., was acquired by Hartford Electric Steel Co., Hartford, Conn. New pit-type annealing furnaces, cleaning and inspection facilities and control devices are being installed. The foundry is expanding production to include the 120-90-02 grade of ductile (nodular) iron in light to

Trailmobile Develops Shiftable Tandem Suspension

Problem of changing base lengths and axle loads in movement of truck-trailers from state to state where laws vary has been solved by Trailmobile Inc., Cincinnati. Officials of the firm are shown inspecting its new shiftable tandem suspension which permits lenghening or shortening of the wheelbase as desired up to 45 in. The tandem is locked in position by two removable steel rods inserted through holes on 3-in. increments in the two stationary beams. One cross-bar locks the forward end of the suspension and the other locks the rear

"Low Maintenance Led Us to Standardize on Clark Electrics,"

SAYS DAVID MacGREGOR, WORKS MANAGER, EDWARD VALVES, INC., EAST CHICAGO, IND. — Subsidiary of ROCKWELL MANUFACTURING CO.

"Our Clark electric 4000-lb. Carloaders have established a low maintenance record so impressive that we decided to standardize on Clarks," says Mr. MacGregor. "We operate nine machines, the first one purchased in '42. They are all the same model—our spare parts inventory is no problem. We get prompt, competent service when we need it—from the Clark dealer or from the factory."

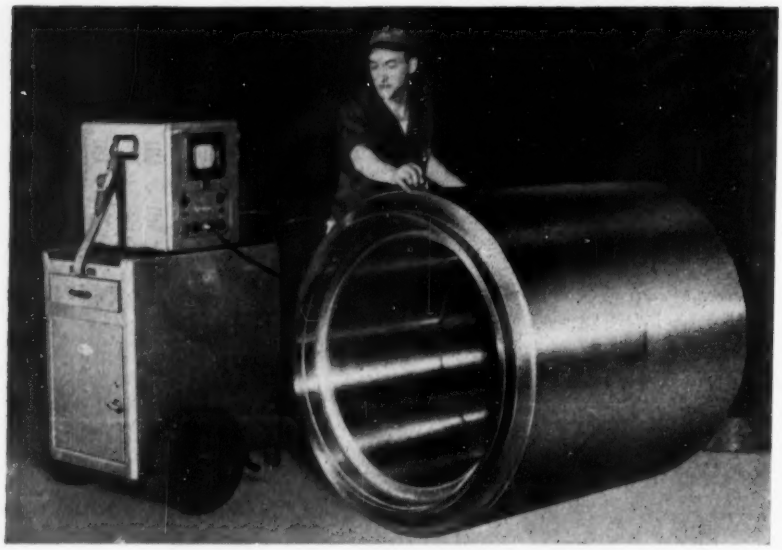
Do you operate fork trucks? . . . or should you?—one, a dozen, a score? Look into the sound economics of Standardizing on Clarks:

- **low maintenance—designed and built to require a minimum of attention**
- **balanced design—all essential features combined with emphasis on stability, ruggedness, safety**
- **complete line—electrics, gas-powered; a right type and size**
- **able counsel to help *engineer* an efficient handling system**

Sensible Step 1 toward a solution of your materials handling problem is to consult the Clark dealer—look in the Yellow Pages of your phone book.

CLARK EQUIPMENT

Industrial Truck Division
CLARK EQUIPMENT COMPANY
Battle Creek 26, Michigan



Ultrasonic Inspection Uncovers Hidden Flaws

Heppenstall Co., Pittsburgh, was one of the first steel companies to make commercial use of ultrasonic inspection. This is an ingenious method based on principles similar to radar. A reflectoscope sends high frequency sound waves through the steel and they are "reflected," forming a pattern of lines on the machine's screen. The inspector, shown operating this machine, can tell the exact size and location of any flaw and can reject any substandard product

medium weight castings and will continue current production of the 60-45-15 grade.

Canadian Firm To Expand

A large expansion program, including considerable machine tool installations, is planned by Standard Machine & Tool Co. for its Windsor, Ont., plant. An additional plant also will be built at Preston, Ont. A big increase in production of Standard's special purpose machine tools is expected.

Damascus Tube Names Agent

Damascus Tube Co., Greenville, Pa., manufacturer of stainless steel pipe and tubing, appointed Industrial Formed Steels Inc., Warren, O., as its representative.

American Bosch Building Plant

American Bosch Corp., Springfield, Mass., is constructing a plant in Columbus, Miss. The factory, containing 100,000 sq ft, is scheduled to be completed by Apr. 1. It will be used to manufacture automotive products, including voltage regulators, electric windshield wipers and small motors. American Bosch will continue to make its precision diesel fuel injection equipment, aircraft components and other electrical products at its main plant in Springfield.

Falcon Foundry Opens

Falcon Foundry Co., a new enterprise in Youngstown, made its first cast last month. The firm, organized by former employees of Falcon Bronze Co. which quit business last summer, took over a plant formerly owned by Harris Fabricating Co. L. M. Nesselbush is president.

Transmission Equipment Moves

Transmission Equipment Co., sales representative for Acme Welding Division, United Tool & Die Co., West Hartford, Conn., opened larger offices at 441 Lexington Ave., New York. Transmission Equipment appointed the following firms as sales representatives for Acme Welding: Henry Holland & Son Inc., Detroit and Chicago; Eastern Brace-Mueller-Huntley Inc., Albany; and Siewert Equipment Co., Rochester, N. Y. These firms and others to be appointed soon will sell Acme welded steel bases, frames and components principally to manufacturers of machine tools, heavy machinery and equipment. Many Acme components go into processing systems for the chemical industry.

Plan Heat Treating Plant

Buffalo Auto Springs Co. Inc. and Buffalo Industrial Trucks Inc., Buffalo, plan to erect a $150,000 building in Cheektowaga, N. Y., for a heat treating plant.

Sheffield Buys Houston Mill

Sheffield Steel Corp., Kansas City, Mo., closed a deal with the federal government's General Services Administration for the last group of government-owned plants which were built during World War II at the corporation's steel mill in Houston.

The units, consisting of a blooming mill, plate mill, shell forging plant and related facilities, were bought for $3,121,782. Sheffield, a subsidiary of Armco Steel Corp., Middletown, O., had operated the facilities under lease since shortly after the end of the war.

The facilities were built originally by the government to make forgings for 155-mm shells. They were converted to the manufacture of civilian products after being leased by Sheffield.

The sale was made in line with the federal government's policy of disposing of surplus properties.

California Firm Changes Hands

American District Steam Co. Inc., North Tonawanda, N. Y., purchased California Steel Products Co., Richmond, Calif. American District manufactures expansion joints, heat exchangers and other related items for the chemical, oil, gas and power industries. The company expects to extend some of these operations to its newly acquired West Coast plant. California Steel has a complete structural and plate steel shop for the manufacture of storage tanks. The company also makes heat exchangers, industrial storage water heaters and boilers. George F. Bont, founder of California Steel, will continue to direct the California plant, which will be operated as a divi-

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longer die life,

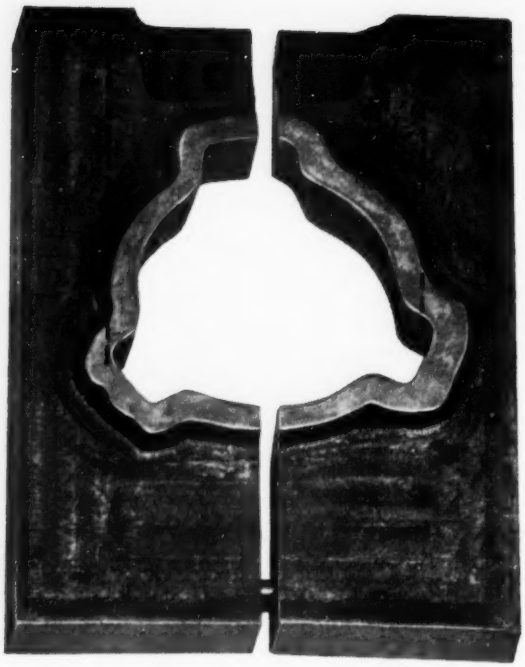
increased production,

lower costs, with

REXWELD

hard surfacing

welding rods



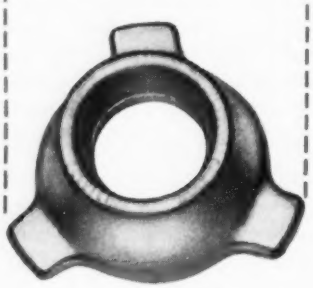
Consolidated Industries, Inc., West Cheshire, Connecticut, greatly increased die life and lowered production costs by hardfacing hot trim dies with Crucible REXWELD.

Rexwelded dies give higher edge strength at elevated temperatures, resist chipping and deformation, and keep clean, sharp cutting edges . . . all of which means longer, more efficient service from an expensive die.

Rexwelding reduces rejects to a minimum, too. This is particularly important when working alloy steel or critical material such as the highly stressed aircraft housing bearings shown above. These were produced from Rem-Cru RC 70 Titanium to close tolerances.

Use REXWELD for *all* your hard surfacing jobs. Surfaces can be Rexwelded many times — greatly increasing the service life of the part. REXWELD Hard Surfacing Rods are available in both bare rods and low hydrogen coated electrodes, in a wide selection of grades and sizes to fit your specific application.

Aircraft housing bearing forged of Rem-Cru RC 70 titanium. (A) Trim die; (B) Forging.



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54 years of Fine steelmaking

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REX HIGH SPEED • TOOL • REZISTAL STAINLESS • ALLOY • MAX-EL MACHINERY • SPECIAL PURPOSE STEELS

sion of American District Steam.

Landis Machine Expands

Landis Machine Co., Waynesboro, Pa., is erecting a plant in that city which will produce collapsible and solid adjustable taps. The building will cost about $250,000. The new facilities will increase the manufacturing and office areas now devoted to tap production by more than 60 per cent.

Industrial Systems Co. Moves

Industrial Systems Co., formerly of New Brunswick, N. J., moved to 32 Main St., Matawan, N. J., in order to facilitate its function as exclusive distributor for Industrial Washing Machine Corp., also of Matawan.

Machine Works Changes Name

California Well Tool & Machine Works, Los Angeles, changed its name to California Drop Forge Co.

McGill Mfg. Builds Plant

McGill Mfg. Co., Valparaiso, Ind., constructed a plant for production of bearings. Cost was in excess of $1 million. The combination of new building, new equipment and more efficient operating conditions will increase productive capacity 35 per cent to 40 per cent.

Cuno Appoints Representative

Cuno Engineering Corp., Meriden, Conn., appointed Jameson Co., St. Louis, as its industrial sales representative in that district.

Solar Buys Rawlins Warehouse

Solar Steel Corp., Cleveland, purchased the warehousing operations of Rawlins Bros. Inc., Los Angeles. The Rawlins Bros. warehouse is being operated as the Rawlins Bros. Steel Division of Solar Steel Corp. of California. Rawlins Bros. Inc. continues to operate its hardware supply business under the Rawlins name. Solar will construct an office building and will add more processing equipment and delivery facilities at its West Coast property.

Pfaudler Forms Research Unit

A mechanical research section was organized by Pfaudler Co., Rochester, N. Y., maker of glassed-steel and alloy processing equipment, to handle experimental and testing work outside the normal scope of the firm's research laboratory.

Gar Wood Forms Division

Gar Wood Industries Inc., Wayne, Mich., established a Mattoon Division, Mattoon, Ill., to handle production of the firm's bulldozers and road machinery. Hunter Dietz is manager of the new division. Gar Wood's bulldozer and road machinery production facilities are being greatly expanded. The Mattoon plant will be made into a self-sufficient road machinery production center. In addition to metal fabricating and assembly, Mattoon will manufacture hydraulic components and other subassemblies formerly produced at other Gar Wood plants.

The Mattoon Division also will provide modern straight-line production facilities for the St. Paul Hydraulic Hoist Division which is moving to Mattoon from Minneapolis. Full production was scheduled to begin Jan. 2.

H. & B. Buys Tyler Machine

H. & B. American Machine Co., Chicago, acquired Tyler Machine Co., Culver City, Calif., and will operate it as part of H. & B.'s Midwest Division.

The Culver City plant will produce spars, bulkheads, trunnions, hinges and similar parts for military aircraft. Plant facilities will be augmented by special machinery for participation in the government's supersonic aircraft and guided missile program.

Robertshaw-Fulton Expands

Robertshaw-Fulton Controls Co., Greensburg, Pa., is expanding its plant in Anaheim, Calif. This division is engaged in manufacture of electronics, electromechanical, hydraulic and pneumatic components for aircraft, guided missiles and fire-control systems. The $500,000 project will provide two research and development laboratories, an auditorium, offices, and an employee cafeteria.

Alan Wood Orders Furnace

Alan Wood Steel Co., Conshohocken, Pa., awarded a contract to George J. Hagan Co., Pittsburgh, for a 55-ft rotary hearth slab heating furnace for its plate mill. The furnace will be equipped with automatic charging and unloading equipment, as well as automatic combustion control, automatic temperature control and automatic fuel changeover to provide a completely automatic installation.

This is the first application of a rotary hearth furnace for heating slabs and the decision to use this mode of heating was made by Alan Wood Steel Co. personnel after extensive tests were carried on by engineers of both companies.

Rebuilds Coke Oven Battery

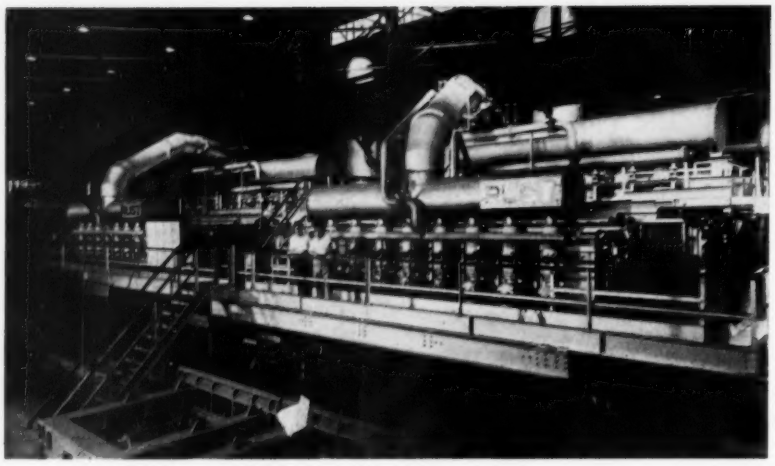
Wheeling Steel Corp., Wheeling, W. Va., awarded Koppers Co. Inc., Pittsburgh, a contract for complete rebuilding of the No. 1 coke oven battery at its East Steubenville, W. Va., Works. The battery will be replaced by a new battery of 47 chemical-recovery coke ovens. Work will start next spring. When rebuilt, the battery will carbonize about 772 tons of coal daily. The plant has six batteries, totaling 314 ovens.

Majestic Acquires Factory

Majestic Radio & Television Division, Wilcox-Gay Corp., acquired an additional manufacturing plant at 41 Water St., Brooklyn, N. Y., as part of an expansion program.

Durant Observes 75th Year

Durant Mfg. Co., Milwaukee, is celebrating the 75th anniversary of its founding this year. This manufacturer of counting and measuring machines for industrial use maintains offices in Providence, R. I.; Greenville, S. C.; Boston, Detroit and Chicago. Officers of the company are W. K. Winkler, chairman of the board; W. W. Winkler, president; R. B. Winkler, vice president; and L. A. Nourie, secretary.



Including continuous slab reheating furnaces . . .

Rust Engineering Co. Has $50-Million Carry-over

THE NEW YEAR finds Rust Engineering Co. and its subsidiaries working on some $50 million worth of major contracts carried over from 1953.

S. Murray Rust Jr., president of this Pittsburgh concern, points out that the carry-over figure comprises only those projects involving $1-million or more. The backlog includes work scheduled for completion early in the year as well as that not yet under way. Rust also has many carry-over contracts involving sums below the $1-million level.

1953 Projects — During 1953, Rust completed major contracts totaling in excess of $100 million, chiefly in the chemical, metallurgical, and pulp and paper industries. Several were federal projects.

In the metallurgical industry, Rust completed work on the multi-million dollar expansion of Granite City Steel Co., Granite City, Ill.; projects for Crucible Steel Co. of America, New York; an addition to the power plant of Woodward Iron Co., Woodward, Ala.; Connors Steel Co., division of H. K. Porter Co. Inc., Pittsburgh, at its Birmingham mill; a conveyor project for unloading bauxite at the Port of Mobile, Ala., for Reynolds Metals Co., Louisville.

Continuing into the new year were projects for Weirton Steel Co., Weirton, W. Va.; Climax Molybdenum Co. of Pennsylvania, Langeloth, Pa.; and a major project for Aluminum Co. of America, Pittsburgh, for whom extensive drying facilities are being built near Rockdale, Tex.

Rust Furnace Co.—A subsidiary, Rust Furnace Co., completed during 1953 four new open-hearth furnaces for Lone Star Steel Co., Lone Star, Tex.; two slab heaters for Pittsburgh Steel Co. at Allenport, Pa.; six batteries of three-hole soaking pits for Youngstown Sheet & Tube Co. at Indiana Harbor, Ind.; a continuous pipe annealing furnace for McWane Cast Iron Pipe Co., Birmingham; and two bar mill furnaces for Colorado Fuel & Iron Corp. in Pueblo, Colo.

Rust Furnace Co. also rebuilt an open-hearth furnace at Ford Motor Co.'s Rouge plant, Dearborn, Mich., in the record time of 39 days. The usual time required for such a project is 60 to 80 days.

Other work completed by Rust Furnace during 1953 involved projects at U. S. Steel Co.'s new Fairless Works, including four continuous slab heating furnaces and a continuous reheating furnace designed for a new bar and billet mill. Completed, too, were a skelp mill furnace and fuel oil facilities for the pipe mill of National Tube Division at Morrisville, Pa.

Just begun was design of a slab heating furnace and five batteries of soaking pits the firm will construct for McLouth Steel Corp.'s $100-million expansion program at its Trenton, Mich., plant.

Rockwell Expands Meter Plant

Rockwell Mfg. Co., Pittsburgh, opened a 19,000-sq-ft addition to its gas meter plant in DuBois, Pa. Among products to be made in the new addition are Rockwell's lightweight "800" aluminum gas meter and a number of other aluminum domestic and industrial gas meters. Production of large-capacity gas meters is being transferred from Pittsburgh to the DuBois plant in order to consolidate the company's gas meter production in one location.

Carborundum To Buy Firm

Carborundum Co., Niagara Falls, N. Y, will acquire Stupakoff Ceramic & Mfg. Co., Latrobe, Pa. Operations of the Latrobe company will continue under the direction of Semon H. Stupakoff, president.

Controls Firm Names Agent

Mechanical Air Controls Inc., Detroit, appointed as its western representative Rucker Co. with offices in Oakland, Calif., Los Angeles and Seattle.

Utility Clamp Moves Office

Utility Clamp & Equipment Co. moved to 108 W. Sixth St., Los Angeles 14.

Chipman Chemical Builds Plant

Chipman Chemical Co., Bound Brook, N. J., is building a plant near Bessemer, Ala. The plant will produce insecticides, fungicides, weed killers and related products for agricultural, industrial and railroad use.

Trion Opens Regional Office

Trion Inc., McKees Rocks, Pa., manufacturer of electronic air cleaning equipment, opened a Chicago regional sales office at 400 W. Madison St. W. R. Murdock is regional sales manager.

Signode Enlarges Facilities

Signode Steel Strapping Co., Wise Ave. and North Point Road, Baltimore, is constructing two plant additions, each of 6000 sq

ft, one to augment space for storage of raw material and the other for storing finished products. When completed the plant will have a total area of 80,000 sq ft.

Buys Welding Machinery Firm

American Brake Shoe Co., New York, purchased the welding machinery business of Leader Welding & Mfg. Co., Berkeley, Calif. The complete line of automatic welding equipment will be sold by the welding products department of American Manganese Steel Division, American Brake Shoe. All of Leader's inventory, tools and machinery used in the manufacture of welding equipment were involved in the sale.

Plans Large Sintering Plant

Steel Co. of Canada Ltd., Hamilton, Ont., will build a $3,650,000 sintering plant which will have a capacity of 1500 tons daily. It will be ready for operation about the end of this year.

Nutting Names Representatives

Nutting Truck & Caster Co., Faribault, Minn., appointed Materials Handling Ltd., Tulsa, Okla., and Stryco Sales Inc., Albuquerque, N. Mex., as its representatives in their respective districts. The Nutting line consists of floor trucks, casters and wheels.

Madison Industries Expands

Madison Industries Inc., Big Rapids, Mich., purchased the gun drill manufacturing operations of Conner Tool & Cutter Co., Detroit. Madison Industries Inc., an affiliate of Madison Mfg. Co., Muskegon, Mich., is in full production in its new plant. Through this affiliation, the two concerns are organized to furnish tools for the machining of holes in a greater range of diameters to the whole metalworking industry. Gun drilling, or deep hole drilling, recently has emerged from comparative discard into one of precision manufacturing's most important processes, says H. F. Wulf, president. The use of Carboloy carbide has expanded materially the application to meet modern production techniques.

EMPLOYEE COMMUNICATIONS

(*Concluded from page* 49)

Homemakers," and even maps of the particular state in which the plant is located are placed on the racks for employees and their families. This material provides a real service for employees which is not only appreciated in itself, but leads them to pick up booklets in the social and economic areas. "Who Makes Your Job?" "Why Kill the Goose?" "Is Business in the Dog House?" and "Profits, Prices and Products" are readily identifiable examples of the attitude-changing diet of social and economic material.

Economics Leads—Although you might predict a cool reception, social and economic material heads the list of booklets picked up voluntarily by employees with 32 per cent. In order, follow home and family with 26 per cent, safety and health 15 per cent, inspirational 11 per cent, GM information 9 per cent and scientific and mechanical 7 per cent. The fact that social and economic material leads the list even when the fare is served up cafeteria style and the employees may take it or leave it alone indicates an appetite on the part of workers that should be highly significant to all management.

Employees want to understand business, and their interest in matters pertaining to business that effect them directly is extremely high. Are you doing your share?

Self-Quiz—Every company has some employee communications, of course, but perhaps yours could be doing a better job. As a start, ask yourself how much information your employees have received on the subjects employees want to hear about listed on p. 48. Do supervisors have the full information? Have employees received recent and full information on the subject? Does a spot check indicate that employees know the score?

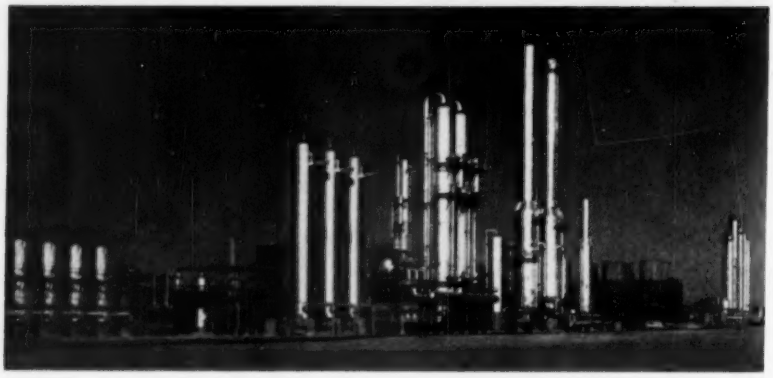
As a check on whether information can flow freely from workers to management, does your company have a procedure known to all employees through which they can get frank and authoritative answers to their questions? When the questions are of a general nature, are the answers made public for the benefit of all employees? Examples of questions submitted to the Carboloy plant paper: "When is the company going to do something about the air ventilation in the tool room?" "Why can't we have better parking facilities on the afternoon shift?" "Why does Carboloy retire workers at 65 years of age?" Can your company handle such questions openly and honestly?

A Closer Look—If things look all right on the surface you might like to probe further through an attitude survey. Written surveys have been prepared by many large companies to find out how employees feel about such matters as future opportunity, compensaton levels, supervision, working conditions and the company's attitude toward them. Your survey need not be elaborate, but it should help you determine if the information is being interpreted as you would like it to be. Facts alone are not enough. Employees need to know what they mean.

Sincerity Pays—Employee communcations is helping to build the employee attitudes that constitute teamwork. The accelerating emphasis on the field during the past two years still leaves considerable opinion clouding the fact in the field. But the notable successes that are being achieved have one underlying principle in common that overrides consideration of technique and method: Sincerity of purpose.

The unions have moved ahead largely through appealing to the desire of the worker for security. This same desire of the worker for security leads him to want to like his company and to be part of it if he has the chance. In a number of cases he has not had that chance, becoming a payroll number whose opinion was neither sought nor listened to and by being kept in ignorance of the reasons for decisions that affected his future.

Effective employee communications is only the means by which the employee is brought back into the company and made to feel that he belongs. The key to success is in the sincerity and depth with which you recognize—and show that you recognize—the employee as an individual.



LP-Gas: Another Sales Record in 1953

Deliveries of LP-Gas increased 443 million gallons in 1953 over 1952, nearly double the increase of 1952-1951. Total sales in 1953 were 4.9 billion gallons, a new all-time high

THE LP-GAS INDUSTRY continued its growth in 1953, selling about 4.9 billion gallons for a 10 per cent increase over the volume of 1952. At the same time, export sales amounted to 120 million gallons in 1953 for almost a 30 per cent gain over the preceding year's sales.

And this is one industry which expects to continue its growth in sales in 1954, says G. R. Benz and P. W. Tucker, both of Phillips Petroleum Co., Bartlesville, Okla.

Pro and Con—Putting the steam behind fast-rolling liquefied petroleum gas sales in 1953 were domestic and motor fuel uses which took approximately 295 million gallons of LP-Gas or 11 per cent more than in 1952; chemical uses which took 1,016,000 gallons, a gain nearly 17 per cent over 1952; and usage of LP-Gas in the making of synthetic rubber components which took 399,000 gallons for a 7.5 per cent increase over 1952.

Industrial and miscellaneous sales slipped nearly 3 per cent and gas manufacturing, or utility usage, dropped 5 per cent in 1953. Main reasons for these declines were above average temperatures especially during the first and last quarters of 1953 and the changeover to natural gas in those areas which were brought under natural gas coverage.

Load-Builders—Emphasis in LP-Gas sales during 1954 will be placed not only on developing new customers but in promoting "load-building" usage with present consumers. For example, domestic usage of LP-Gas in 1954 will be strengthened by the 450,000 ranges for LP-Gas use which were sold during 1953. In addition, 285,000 LP-Gas water heaters were sold in 1953; the LP-Gas clothes dryer proved to be popular; and shipments of floor, space and wall type furnaces were 400,000 in 1953. It's estimated by Messrs. Benz and Tucker that 7.5 per cent of the warm air furnaces sold last year were units utilizing LP-Gas.

Agricultural applications are growing each year too. These now include use of LP-Gas as tractor fuel, stock tank heating, brooding, flame weeding and stationary engine fuel.

Distribution Dilemma — One of the major problems of the industry has been getting adequate distribution channels for mushrooming LP-Gas usage. Part of that problem consists of transportation. Nearly 2100 LP-Gas railroad cars were added during 1953; a new sea-going LP-Gas barge to serve Florida and Cuban markets was launched; truck movements of LP-Gas showed a big increase during the year.

Another facet of the distribution problem is lack of storage facilities at the user end of the supply line. With facilities put into operation during 1953, there are now 67 completed underground storage installations having a capacity of more than 205 million gallons. Seventy-six more such installations which would add 285 million gallons storage space are either under construction or in the planning stage. The storage picture has never been brighter.

Look Ahead — As further evidence of the confidence which LP-Gas producers have in their industry, 15 plants with an estimated production capacity of 550 million gallons per year came into production during 1953. This year at least 12 more plants will come into operation, adding more than 220 million gallons per year capacity.

Rockwell Expands Plant

Rockwell Mfg. Co., Pittsburgh, is building an addition at its Norwalk, O., plant to house the production of its smaller, balanced-valve gas regulators. It is expected to be completed by early next month.

Mercury Mfg. Names Agent

Mercury Mfg. Co., Chicago, manufacturer of fork trucks, trailers, and materials handling systems, appointed Hamerslag Equipment Co., San Francisco, as its representative in northern California.

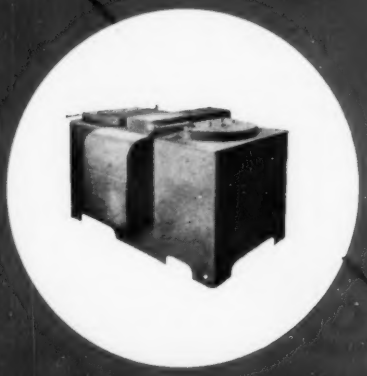
Harrisburg Buys Plants

Harrisburg Steel Corp., Harrisburg, Pa., purchased all the physical assets of Taylor-Wharton Iron & Steel Co., High Bridge, N. J., and changed the name of the latter firm to Twisco Corp. The firm makes manganese steel and special alloys castings, seamless cylinders, special trackwork and forgings. Plants are located in High Bridge, Cincinnati, Birmingham, and Easton, Pa.

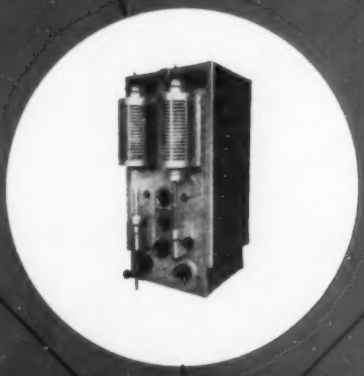
Pratt & Whitney Moves Branch

Pratt & Whitney Division, Niles-Bement-Pond Co., West Hartford, Conn., moved its Los Angeles branch office to larger quarters at 3016 E. Olympic Blvd. The office is under the management of Daryl W. Callen, district manager. The office will handle machine tools, cutting tools and gages produced by Pratt & Whitney and its subsidiary, Potter & Johnston Co., Pawtucket, R. I.

..melting furnaces

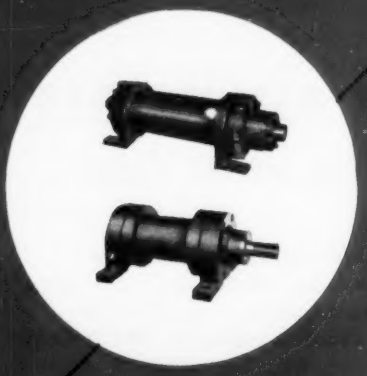


..laboratory equipment

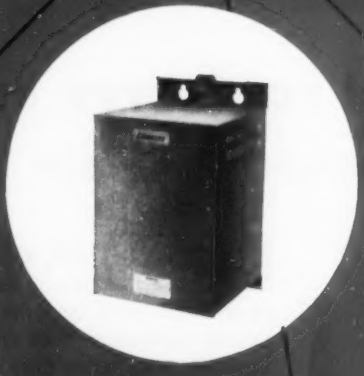


..blowers

Heat Treating Furnaces...Yes!
and *LINDBERG* also builds..



..hydraulic cylinders
..air cylinders



..transformers

..high frequency induction units

In addition to heat treating furnaces, Lindberg designs and builds a broad and varied line of related products . . from air cylinders to high frequency induction units.

The story of the complete line of Lindberg products is told in a newly published bulletin. Ask your local Lindberg Man for a copy (#250), or write Lindberg Engineering Company, 2450 West Hubbard St., Chicago, Illinois

LINDBERG FURNACES

More Features of EC&M TYPE SW ALL-WELDED LIFTING MAGNETS Assure More Dollar Value

EC&M Type SW ALL-WELDED Lifting Magnets have a new look . . . inside as well as outside. Stronger, better designed to withstand the hard knocks encountered in magnet operation, they are easier to maneuver, and through high lifting capacity they reduce handling costs.

The magnet-coil is wound between turns with purer, thinner asbestos tape, with its strength increased by impregnation with EC&M No. 281 compound. Between layers, the insulation is a new product—ECAMICA board which is moisture-free, has high dielectric strength and excellent mechanical ability. A new fabricating process locks the windings against movement.

Look at the features pictured here in the top and bottom views of the magnet. Remember, too, that these EC&M magnets are ALL-WELDED to keep pole shoes tight—to keep moisture out—to increase the efficiency of the magnetic circuit and to prolong magnet life.

write for bulletin 900

1762

THE ELECTRIC CONTROLLER & MFG. CO.

2698 EAST 79TH STREET ★ CLEVELAND 4, OHIO

STEEL

January 18, 1954

Technical Outlook

EXTRUSION CUTS PARTS' COST—At Lockheed Aircraft, impact extrusion methods quick-form several hundred different parts. They're using a 1000-ton Bliss impact extrusion punch press. Company has saved up to 75 per cent over the time required to produce the same parts by machining, and 90 per cent in material. Lockheed engineers estimate that by transferring only 15 parts to the press, they will save in excess of $50,000 a year.

TITANIUM IS CAST— Problems of successfully casting commercial alloys of titanium are being solved. Up until now, high rate of reaction between molten titanium and investment materials has frustrated casting attempts. Mercast Corp., working with Alloy Precision Castings Co., recently poured in the laboratory an aircraft latch using a modified Mercast ceramic mold. Mercast process uses a frozen mercury pattern.

OPTIMISTIC NOTE— Look for the reinforced plastics industry to increase its business up to 40 per cent in '54. Society of the Plastics Industry expects several developments to break during the year: Plastic body components for trucks, station wagons and farm equipment; resins that keep their mechanical strength under continuous exposure to certain heated liquids; progress in pipe making; and new reinforcements, chiefly synthetic fibers.

SUPER SCANNER— Science is tackling the problem of developing electronic machines that may eventually be able to scan up to five million published documents per hour and identify those relating to a prescribed information need. Such screening is vital to engineers, scientists and research managers. Those close to the development at Battelle Institute warn against looking upon it as a panacea for the information-hunting problem since the machine will be a moronic robot—with no ability to understand. Eventual success of the machine depends on the development of an adequate machine language. In spite of these obstacles, machine will certainly beat the pants off any previous data-sorting system.

HOT X-RAY— Word comes from Oak Ridge National Laboratory that they have developed an x-ray camera that studies materials at temperatures up to 4000° F. Designed for ceramic research, it has produced diffraction patterns of hafnium oxide and other metals and oxides.

QUIET, PLEASE— Engineers now know how to produce a motor that hums just enough to show it's running, but not enough to be a bother. How to do this most surely and economically, however, is still a challenging problem, according to P. L. Alger, General Electric Co. In a paper presented at the winter meeting of the American Institute of Electrical Engineers, Mr. Alger said, "With the present trends toward totally enclosed and highly ventilated motors and the more extensive use of ball bearings, the problems of reducing the noise due to windage and mechanical causes are becoming more important."

ONE-PIECE HANDLE—Stainless steel hollow-handled knife for tableware is being produced in one piece—eliminates usual practice of brazing or welding of two shells. Gorham Mfg. Co., Providence, first developed the hollow handle in 430 stainless; from nickel chromium stainless an improved product is likely. From a stainless cup, a small-diameter cylinder is drawn to required length by multiple deep draws and corresponding anneals, six to seven. Cylinder is swaged and the pattern or design is stamped on.

Metalworking Outlook—p. 29 *Market Outlook—p. 107*

North American Philips Co.

This 160-kvp x-ray unit is extremely portable. It can be taken out into the field to inspect such things as tanks

What's New

IN NONDESTRUCTIVE TESTING

Wide variety of equipment is available to meet the diverse needs of industry. Where possible, inspection and testing are being put right into the production line

By S. A. WENK
Battelle Memorial Institute
Columbus, O.

"YOU'VE overlooked our latest competitive wedge," the chief engineer suggested to the president as they scanned the first draft of the chief executive's annual statement.

"Up-to-date facilities, scientific production methods and trained help aren't enough to stay in fast company these days," said the engineer. "We must build extra quality into our products and keep costs down in doing it. So we turn to such things as in-process and rigid, final-inspection quality control; these are the pluses we've got to sell."

This management attitude, a far cry from the day when inspection and testing were considered necessary evils, mirrors the thinking in industry today. So the question comes up: What are the inspection and testing people doing to keep up with the needs of industry? This survey indicates they are more than maintaining their end of the bargain.

War Baby—During World War II, radiography, first used in medicine, was introduced into industry. Now, x-ray equipment ranges from automatic units that measure tin plate a few millionths of an inch thick to multimillion-volt machines that penetrate more than a foot of steel.

In the last two years, the spotlight has been on portable x-ray for field work and remote shop areas. Typical users are shipbuilders, structural welders and aircraft maintenance and foundry men. Special-purpose units inspect circumferential butt welds in natural gas transmission lines.

Equipment — The General Electric Resotron has an x-ray tube head that weighs less than 150 pounds—it is 14½ inches in diameter, 44 inches long. A small control unit operates the tube up to 200 feet from the power supply and 50 feet from a portable water cooler. It runs off 220 or 440-volt, 60-cycle, 3-phase current. Tube has a range of 75 to 250 kvp and 2 to 10 milliamperes.

At the 1953 Metal Show, a portable, 260-kvp unit with a 65-pound head was exhibited by Triplett and Barton. It takes 220 or 440-volt, 3-phase current and is self-rectified. Power supply, cooler, cooling lines and cables are in a shop-type, push buggy. The tube—it can work at 10 milliamperes—is a side emission type with a small focal spot. The 35-degree cone is anode grounded. A 360-degree tube is optional.

North American Philips has a highly-portable, 160-kvp unit. Tube head weighs 145 pounds and produces a 40-degree, collimated-beam of x-radiation at 6 milliamperes maximum. Because of its small focal spot size, tube can produce high definition radiographs at short source-object distances. Power supply and controls are in a portable, box-type cabinet. Power is 110 or 220-volt, 60-cycle current. Design makes tube changing easy.

Others — Holger Andreason Co. (U. S. distributor for Danish-made Andrex equipment) has portable units with 125, 175 and 250 kvp outputs. Control panel can be operated 30 feet from tube head. Units run off 110, 220 or 440-volt, single-phase current; and tubes have a maximum output of 5 milliamperes. Tube heads weigh about 125, 175 and 250 pounds for the three ranges. They pass easily through portholes to inspect ship-hull welds.

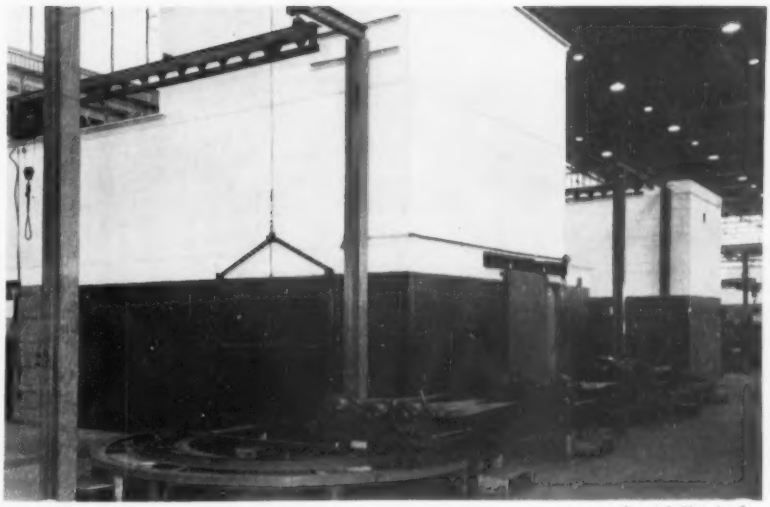
North American Philips also has a series of constant-potential, x-ray units. They are 150 and 300 kvp. Tubes feature a small focal spot; and constant potential current permits shorter exposure times. Tests show penetration is slightly greater than conventional units at the same kvp. Rod anode tubes with 360-degree radiation also are available.

In addition to portable, general-purpose units, special-purpose production units are being put into production lines handling high-volume, critical-test parts. They include aircraft propeller blades and aircraft engine parts.

Radioactive Isotopes — While cobalt-60 is fairly common in gamma radiography in this country, other pile-produced isotopes lag behind European practice.

In the last two years, much work has been done with iridium-192—it emits radiation about equal to 250 to 450 kvp x-rays. With it, excellent radiographs have been obtained on a wide variety of test objects. A multicurie source in one exposure, for example, checks all welds in a Horton sphere and the circumferential weld in a submarine hull. Another use is the inspection of circumferential welds in natural gas transmission lines.

Other isotopes, such as sodium-24, cesium-134 and hafnium-181, remain in the lab stage. Short half-life of most isotopes has been a deterrent; and problems of production and supply have greatly restricted their use in this country.



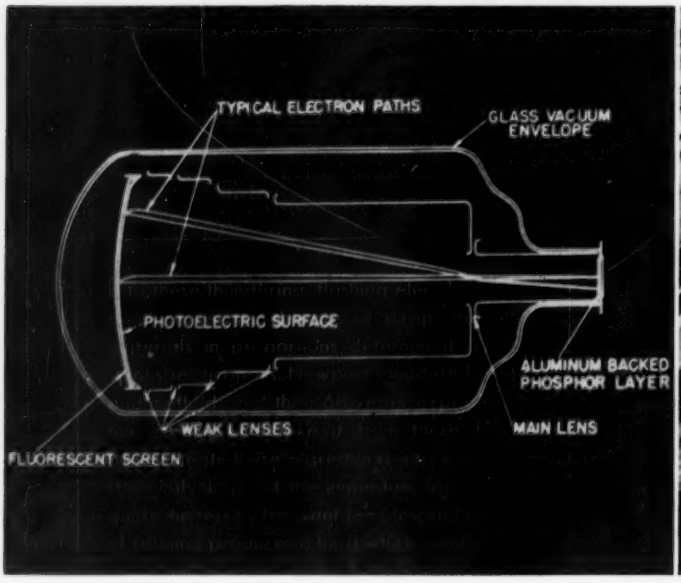
General Electric Co.

In addition to portability, x-ray equipment also is being built for special-purpose work. Here propellers are tested

Filmless Methods—Fluoroscopy has been in industry for some time. Until recently, limits in contrast sensitivity and definition restricted it to noncritical testing (large numbers of similar units). Westinghouse X-ray Division now has a fluoroscopic unit with contrast sensitivity of 1.5 per cent on 1-inch-thick magnesium at 80 kvp and 30 milliamperes—5 to 7 per cent once was considered top performance.

The development will extend fluoroscopy to critical inspection

Portable Magnaflux Corp. unit is being employed here for the inspection of a natural-gas, field transmission line



Here is a schematic view of the Coltman, image-intensifying tube that is being used in the Westinghouse Fluorex unit

At the Longbeach, Calif., plant of Douglas Aircraft Co., this Zyglo unit is used for the inspection of spar caps

where permanent records are not needed. Since the method lends itself to conveyorization, high inspection rates at lower cost are possible. Another advantage: Test object can be rotated in the x-ray beam. This allows more angles of viewing at lower cost.

More Filmless—Another development is the Westinghouse Fluorex unit. Its heart is the Coltman, image intensification tube. Here's how it works:

X-rays passing through a test object strike an input fluorescent screen in the tube that converts x-ray energy into light energy. Screen is backed with a photoelectric screen that converts light energy to freed, low-speed electrons—number emerging from the screen depends upon the amount of x-radiation hitting fluorescent screen.

Focusing elements speed up and refocus electrons into a sharp image on the output phosphor. It converts electrons into a visible light image—1 inch in diameter and 100 times brighter than the input phosphor. With an optical system, image is re-inverted and magnified to a 5-inch diameter on a viewing mirror.

Potential uses include inspection that requires film techniques to resolve small defects; and, in time, stereofluoroscopy can become a reality with this system.

Magnetic, Penetrant Tests — During the course of the last two years, both have won jobs in quality control and in receiving departments. In the latter spot, metalworking and fabricating industries use them to inspect raw materials, semifinished and finished parts.

Single-purpose, automatic and semi-automatic units of both types are in production lines for large-volume inspection of a wide variety of critical test objects. Many are conveyorized, with automatic handling and processing devices.

Portable versions of both are gaining popularity for preventative maintenance inspection. Recent penetrant development is the Magnaflux Corp. post-emulsification Xyglo. Emulsifier is added after the penetrant has been used. Greatly increased sensitivity has been reported.

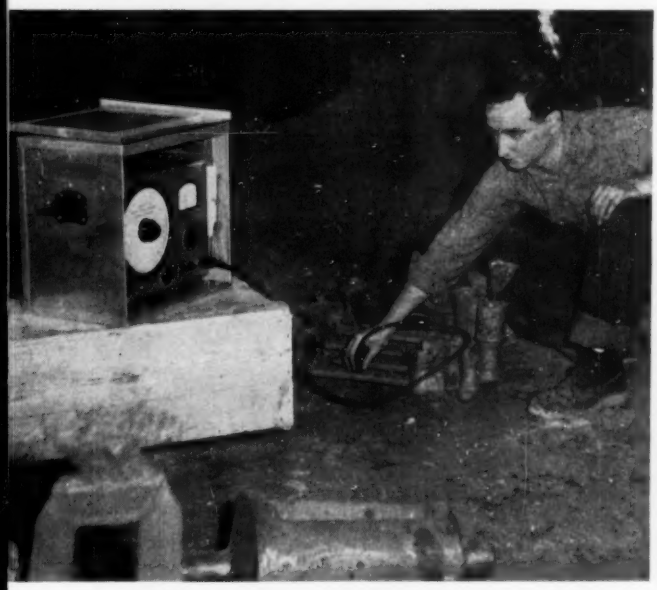
Ultrasonics — Resonant frequency and reflection types of equipment are commonly used.

Resonant-frequency method establishes a standing wave in the test object. Its frequency is directly proportional to the thickness of the test material. So the method is handy for thickness measurement where only one side is available for test. It also detects laminar-type defects.

At the last Metal Show, Branson Instruments unveiled its Vidigage, which has an accuracy range of 0.1 to 1 per cent, depending upon the application and thickness range. Data are presented on a 21-inch, cathode-ray tube. It has a removable, direct-reading scale that is read directly in thousandths of an inch; and in some ranges, it is possible to estimate to 0.0001 inch. Unit can be made automatic for repetitive work.

Reflection Type—Here the reflection of beamed ultrasonic waves from a discontinuity within the test object is used to advantage. Reflectoscope is an outstanding example. During the last two years, it has been turned to extensively in a new technique, the immersed method.

A tank is filled with water, and the transmitting receiving crystal is mounted in the tank. (Water-gap dimension between the crystal and the part being tested is critical.)



Inspector is taking conductivity measurements of as-cast transformer secondaries at Philadelphia Bronze & Brass Co.

Branson Instruments Inc.

Thickness of a brass aircraft part is being measured with the Vidigage, which was introduced at the 1953 Metal Show

Water is an excellent conductor of sound; it acts as a column to conduct sound waves from the crystal, to and through the part and back to the crystal.

Multiple reflections between the crystal and the surface of the part are far enough apart to avoid detraction from flaw readings near the surface. Manual or automatic position controls allow positive crystal positioning in three planes, as well as for the angulation of the crystal; so that irregular contours can be examined without relocating the test piece.

Technique is making a hit in the airframe industry. Higher frequencies (10 to 25 megacycles) make it possible to detect minute physical and metallurgical discontinuities in critical parts, such as unhealed porosity in aluminum forgings. Sperry has an automatic recording device to make a permanent record.

FM Beam—A new instrument by D. C. Erdman of Electro-Circuits Inc. has a frequency-modulated, ultrasonic beam rather than a pulsed beam. Three types of data presentation are available.

On the Conventional "A" scan, the reflected beam from a discontinuity is shown as a pip on a cathode-ray tube. "B" scan gives a cross-sectional view of the test piece under the crystal on a long-persistence, cathode-ray tube. Any discontinuity appears as an indication on the tube face between horizontal sweep lines representing the top and bottom surfaces of the test object. "C" scan draws a plan view of the discontinuity. A facsimile-type scanner is available to provide a permanent record of any of the three scans.

Thermoelectric Test — Doscheck Associates has a Thermoelectric Metalsorter. Thermoelectric properties of a material are measured by placing a reference standard metal in contact with the sample; and measuring the emf generated at the junction of the two dissimilar metals. A hot and cold junction are employed; and the emf is measured by a suspension-pointer galvanometer.

Unit takes 110-volt, 60-cycle current. Weighing only 9 pounds, it makes a test a minute. Test piece surface must be clean, free from oxides and representative of the alloy—no decarburization, etc. If conditions are met, instrument quickly sorts alloys and differences in heat treatment of alloys of similar type.

Conductivity—Instrument for directly measuring the electrical conductivity of material has been introduced by Magnaflux Corp. With a hand-held probe, it measures absolute conductivity of nonferrous conducting materials directly. Known conductivity specimens come with the instrument for calibration. Measurement is directly in per cent of the International Annealed Copper Standard.

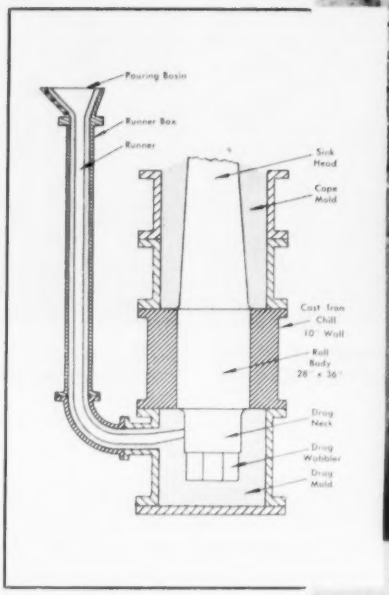
Instrument is a valuable sorting tool for a wide range of alloys; and it also evaluates certain physical properties. For example, incomplete quenching of light metal alloys often results in the appearance of soft zones.

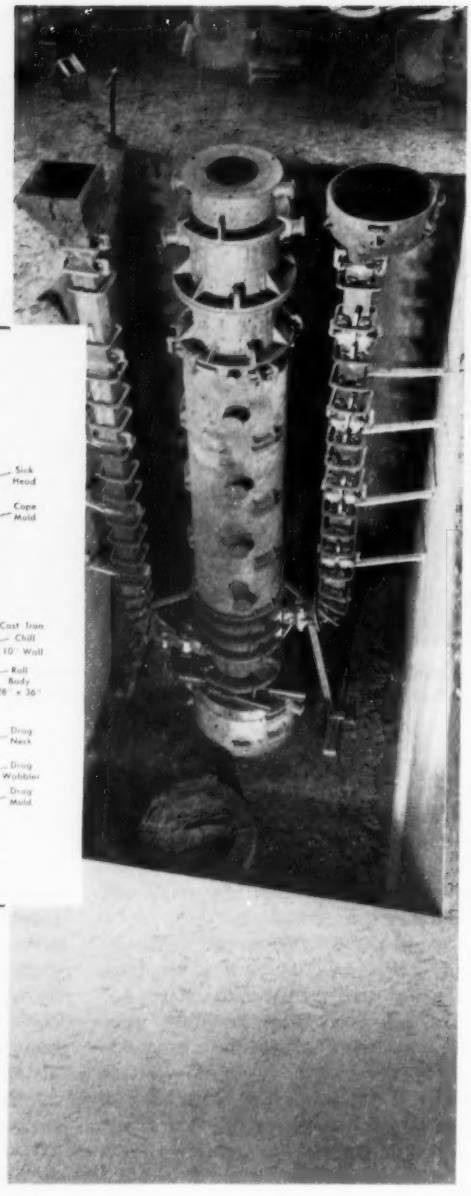
Occasionally, this same type of flaw is at the end of extruded sections. If the surface of the section is rapidly scanned, the softer zones are detected because of variation in conductivity at these points.

Another important use is the control of melt purity (metals and alloys), where certain agents affect conductivity—phosphorus in copper, for example. Here conductivity is checked on a small, cooled sample of the melt.

ROLLMAKING ART GOES modern

To keep up with the demands of the metal rolling industry, rollmakers are refining their centuries-old art with help of modern science





Mold for a large plate mill roll assembled in pit ready for pouring. This 28-inch roll will be 14 feet long and weigh 16 tons. Inset shows chill mold section

COMPROMISE is the essence of modern rollmaking. In a general sense, the rollmaker is striving to obtain a combination of varied properties . . some of them incompatible with each other. . so that the finished product will do the intended job.

Strength, so necessary in roll necks where stresses are most severe, must be balanced against the hardness of the roll face itself. But roll hardness can't be too great or the roll's bite (its ability to grasp bar, bloom or slab and pass it through rolls) will suffer. Compromising these qualities has helped rollmakers evolve some unusual production techniques, especially in cast rolls.

Iron or Steel?—An almost infinite variety of rolls in both categories is possible with the many alloying elements used—silicon, nickel, chromium, molybdenum, manganese and vanadium—in various combinations. Cast iron rolls are generally used for finishing operations where very hard rolls are needed to give fine surface finish.

Cast steel rolls come in two classifications, carbon or alloy steel. Longer effective life of the alloy steel rolls, however, have practically banished the carbon steel rolls from the market. Steel rolls are generally used in the heavy-duty mills where strength is more important than surface finish.

Preparing Mold—Mold for a cast iron roll is, in reality, a built-up assembly of five components—the chill for the roll body, the two ends for the necks and wabblers, the hot top for the sinkhead, and the runner. A sand iron roll, on the other hand, is cast in a mold made entirely of sand, which closely resembles a mold for cast steel rolls.

Alloy content of a sand iron roll is the only factor that influences the hardness of such a roll. The close control of hardness and strength obtainable by casting iron rolls in "chill" molds makes chilled rolls much more popular, and only a few sand iron rolls are used today.

Chills and Runners — Most cast iron rolls are "chilled" rolls, with their bodies cast in cylindrical metal "chills," which hasten the cooling of the outer surface of the roll

From the book *Rolling Mills, Rolls, and Rollmaking* published by Mackintosh-Hemphill Co. on the occasion of its 150th anniversary, 1953.

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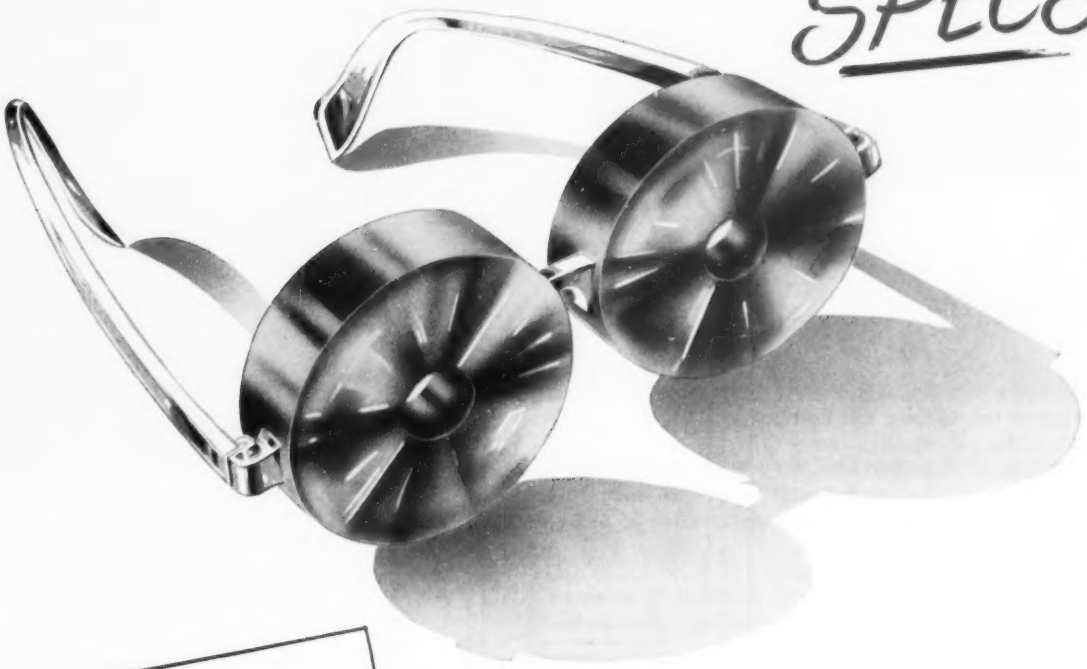

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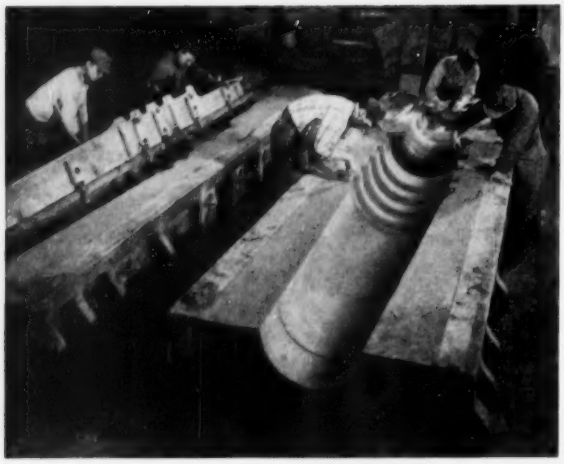
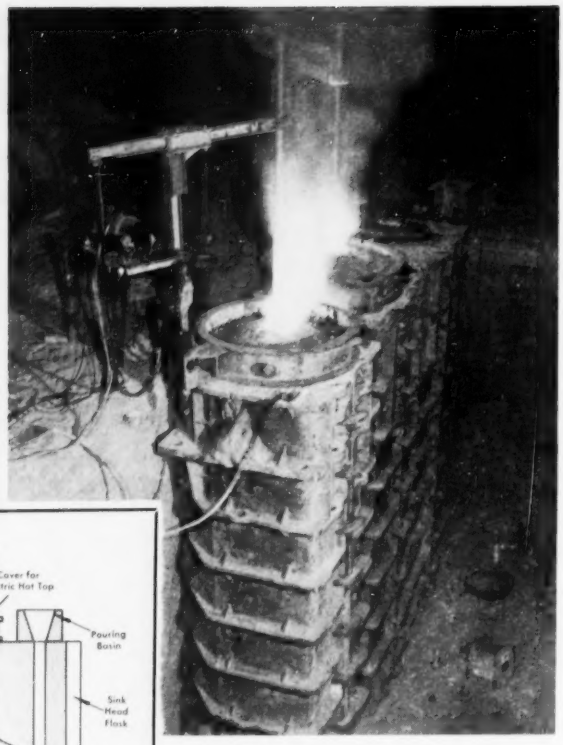
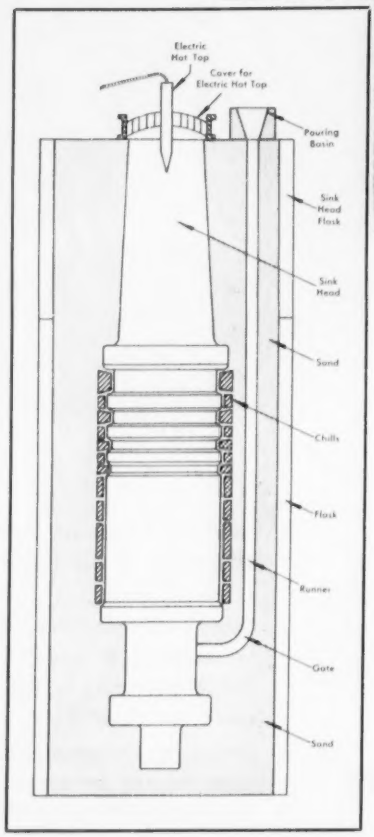


In cast steel rolls, metal is poured through runners inside the mold. Electrode hot-tops reduce sinkhead sizes and give better cooling control



Mold for cast steel roll is constructed entirely of sand inside flask. Roll contour sweep is used to shape sand. Large headed nails are driven in to add strength in critical spots



body and make it extremely hard.

The runner for an iron roll is a sand-lined, funnel-capped, steel channel which extends for almost the full length of the assembled mold itself. Purpose of the runner is to conduct the molten iron to the gate and thence into the bottom of the mold.

Tapping the Furnace—Furnace in which the alloy iron has been prepared for a roll is closely controlled so that, when the mold is ready and the iron is at exact temperature, furnace is tapped. If the roll to be cast is an exceptionally large one, two or more furnaces have been charged with the proper alloy combination, and these are tapped simultaneously into separate lipped ladles.

Slag is carefully skimmed from the surface of the molten metal in the ladle and the temperature is taken with an optical pyrometer. When cooled to the proper predetermined temperature, ranging from 2400 to 2550° F, the lipped ladle is tipped to decant the iron from it into the funnel-shaped top of the runner.

Casting Rolls — Cast iron rolls are poured at the rate of up to 50 tons of molten iron per minute, to create greater swirling motion of the metal.

Swirling motion of the molten iron, previously mentioned, is imparted by the tangential location of the gate in the bottom of the mold, to retain non-metallic particles of slag and dross in the center of the roll mass, rather than at the surface, where they can cause trouble. The foreign particles retained in the molten center mass thus have an opportunity to rise into that portion that is later discarded.

The Double Pour — For many years, the roll industry sought an alloy, or alloy mixture, that would give a roll with hard, wear-resistant body surface, yet with body core, necks and wabblers that would withstand the shocks and stresses that they would have to encounter.

This seemed a nearly impossible combination to obtain, and tough necks and wabblers had to be sacrificed if a very hard body surface were necessary, and vice versa.

However, the introduction, in 1936, of a method of double pouring rolls solved a great many of the difficulties, and today almost all alloy cast iron rolls in the upper hardness ranges are double poured, using either one of two methods: Composite or inoculation.

Composite Pour—After the roll has been cast, and the molten iron has filled the mold and the hot top, it is then permitted to stand for a predetermined time which is just long enough so that the metal in the body chill may solidify to the proper depth but short enough so that the metal in the sand molds

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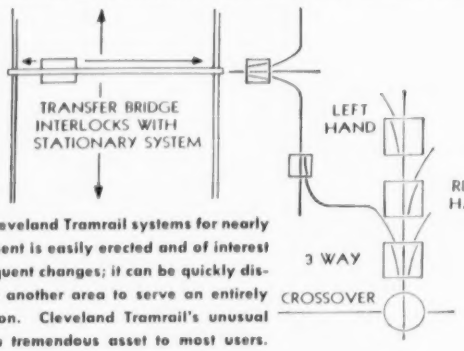
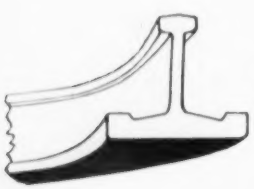
CLEVELAND TRAMRAIL ERECTION FLEXIBILITY A GREAT ASSET



Various track switches, interlocks, cross - overs, and other track features make it easy to develop Cleveland Tramrail systems for nearly any situation. The equipment is easily erected and of interest to plants encountering frequent changes; it can be quickly dismantled and re-erected in another area to serve an entirely different handling operation. Cleveland Tramrail's unusual flexibility of erection is a tremendous asset to most users.

LONG LIFE TRACK



Cleveland Tramrail track—either standard rail or arch beam—has a wear factor far beyond that generally obtainable elsewhere because, first, it is of high quality and hardness and second, it is provided with thick treads or wearing strips. Only after the treads are completely worn away will the lower flanges begin to peen and turn downward slowly. As a result, Tramrail track has many additional years of useful life.

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(necks and wabblers) remains molten.

A molten alloy that is softer and tougher than the original alloy that now forms the body surface is poured into the top of the mold. This metal replaces that portion of the original metal that is still molten in the mold and flushes it back out through the runner, where it is caught in a ladle for reuse.

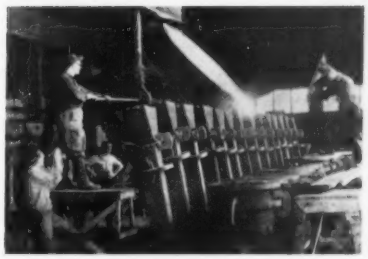
Color Check—As soon as the color difference shows that the newer, hotter alloy is coming back out through the runner, the second pour is stopped, and the roll and its continuing mold are permitted to cool naturally.

Composite pouring may also be accomplished by permitting the proper time to elapse after the first pour, then pouring the softer, tougher alloy into the same runner into which the hard alloy was poured, with an overflow opened at the base of the upper neck of the roll. The overflow is stopped up when the newer, hotter metal begins to flow from it, and the pouring is then continued until the upper neck and the hot top are completely filled.

Inoculation Pour — When this procedure of double pour is being employed, the original molten metal is poured through the runner only until it reaches the top of the roll body. Roll is then permitted to stand for a predetermined time to solidify the proper body surface thickness of metal at the body chill.

A second ladle containing a considerably softer and tougher alloy is then positioned and tipped so that the molten metal runs into the runner. This metal is poured until the total metal of both pours reaches the top of the hot top on the mold, when the pour is stopped and the roll and mold are permitted to cool naturally.

Removing the Mold—A cast iron roll is allowed to remain in the mold for a cooling period of from 12 hours to a week, depending upon the size of the roll casting. After the roll has cooled sufficiently so that it can be handled, the mold, with the roll inside, is hauled up from the pouring pit by an overhead crane and deposited on the foundry floor.



Not all rolls are large. These small molds are lined up on the pouring floor for simultaneous pouring

Another modern touch. Metallurgist using supersonic reflectoscope gives roll close check before the final O.K.

Steel flasks containing the various portions of the mold and the body chill, are removed from the roll casting. The mold sand is removed from the flasks and the roll, and reprocessed and returned to storage bins for reuse.

Finishing the Roll—The roll casting, after being thoroughly cleaned so that none of the molding sand is clinging to it, is taken to the machine shop, set up on a roll lathe and turned to the degree of finish specified by the roll user. This finishing operation, on most large rolls, entails work on two roll lathes —one for turning the roll body and another for the fillets, necks and wabblers.

Because of the necessity for using a large sinkhead, together with the excess stock required on the top neck, the metal of the runner, and the allowance for finishing, appreciably more metal is required in pouring a cast iron roll than is eventually delivered to the user.

Cast Steel Rolls—The methods of manufacture of cast steel rolls are generally similar to those used in making cast iron rolls, but with some essential differences, notably the making of the steel and the design of the mold.

Carbon and alloy steel cast rolls are usually made of acid open hearth steel, although basic or electric furnace steel is occasionally used. High quality pig iron and steel scrap are charged in the open hearth furnace, together with the necessary fluxing material. Certain alloys are added to the molten bath in the furnace, while others are added in the ladle.

Preparing the Mold—The mold for a cast steel roll is prepared in the two halves of a steel flask, split lengthwise. Each half is filled with high-silica molding sand which is thoroughly tamped down. Sand in each half-flask is shaped by means of a sweep, which is a metal-edged flat piece of wood with the same outline as the contour of the roll.

Sand is carefully smoothed down, iron quadrants are put into place to form half-rings that make the necessary grooves in the roll and to slightly harden the groove areas by chilling them. Two gates are cut into the mold for very large rolls (or one gate for smaller rolls) near the bottom.

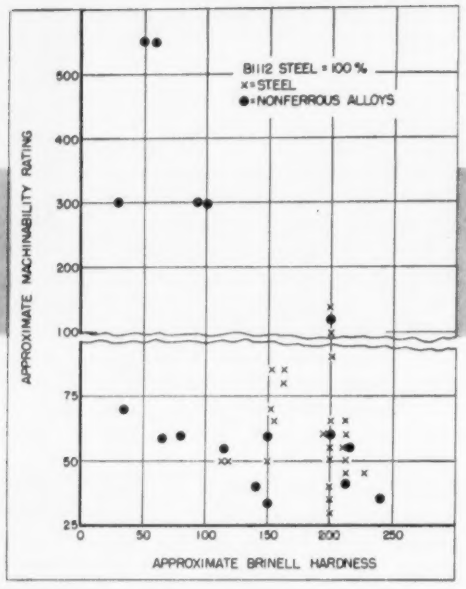
Casting the Roll—Cast steel and alloy cast steel rolls are poured in much the same way as cast iron rolls. Steel rolls, however, are poured at a temperature of about 2600°F to 2700°F, depending upon carbon content, at a rate of about 2½ to 3 tons per minute.

Electric arc hot top mechanisms that keep the metal of the sinkhead molten in the hot top for a considerable time after pouring, are now in general use.

Heat Treating — Exact balance between strength and hardness in cast steel rolls is achieved through annealing, normalizing and hardening.

Treatment will vary for every type of roll composition and the specific use for which each roll was designed. Single anneal is used to break up the as-cast structure and soften the roll. Process usually takes a week for slow heatup and cool down.

Double anneal may be used if even softer roll is desired. Fine grain structure enables these rolls to resist breakage in even the heavy-duty assignments.



Poor correlation of hardness vs machinability

How To Determine Machinability

Inherent ability of the workpiece material to aid cutting tool is part of the rapid-machining picture. Big part is also played by environment — speeds, feeds, etc.

By FRANCIS W. BOULGER
Division Chief
Battelle Memorial Institute
Columbus, O.

METALLURGISTS define good machinability as the property of a metal which permits it to be processed in a machine shop without antagonizing the machinist.

This definition, suggested by A. B. Kinzel, Electro Metallurgical Co., is a good one since it shows we believe that both cutting conditions and properties of the material are important.

Complex—Since the metallurgist cannot control the machining conditions, he can't consider machinability a simple property like hardness or tensile strength. Machinability depends on the inherent properties of the material and also on the environment—the machining operation.

Hardness isn't necessarily a good indication of machinability. Hardness can and does indicate tensile strength because both are simple properties. Relationship between hardness and machinability, however, is too general to be useful.

This is the second of two articles on machinability. The first article, which appears in last week's issue of STEEL, covers the free-machining leaded and resulphurized steels.

Test in Action—A cutting test is the best way to measure machinability. To be reliable the test must simulate the operation of interest commercially. Machinability rating of a particular alloy varies with the machining operation.

Study by Cook and Davis on the influence of copper content on the machinability of leaded brass shows effects of metallurgical changes can even differ qualitatively in different operations.

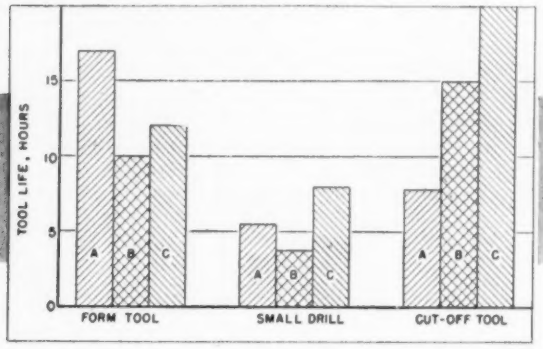
Reason—Such discrepancies in machinability ratings are sometimes caused by conflicts between two operations in machining—cutting chips from the workpiece and disposing of the chips without interfering with the cutting action.

Sawing tests with fine and coarse blades sometimes give conflicting results when comparing low sulphur and high sulphur steels. Because of difficulties in chip disposal, materials which are markedly better in milling or turning may not be outstanding in drilling or tapping operations.

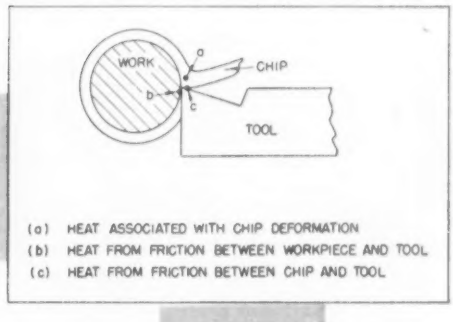
Heat—Data obtained by John Armour with a screw machine also shows the importance of the machining operation. The same steel was tested in three conditions of heat treatment.

One heat treatment was best, with respect to tool life, for the form tool, but was poor for the cutoff tool. Another was best for drilling and cutoff but not for the form tool.

Tool life when machining a steel in three conditions



Drawing shows sources of heat in metalcutting



Production Zip—Type of machining operation involved affects the opinion of the machinist about machinability of different materials. At the same time, conditions used in the same operation affect the tool performance. Most operating men like to increase production. A metal that has better machinability should permit faster production rates.

The limiting production rate depends on tool life. Usually the shop uses the fastest machining rate which will permit the tools to remove a specific amount of metal. One way to increase the production rate is to increase the cutting speed, keeping other conditions constant. This shortens tool life.

Diminishing Return—If the tools have to be reground after 0.020-inch wear, it is possible to remove 27 cubic inches of cast iron at 1150 surface feet per minute, or 105 cubic inches at 510 sfm, or 270 cubic inches of cast iron at 250 sfm or 450 cubic inches at 210.

Doubling the rate of metal removal by increasing the speed decreases the useful cutting life by about 55 per cent.

Feed System—Better way of improving the rate of metal removal per unit time is to increase the feed. Feed is the rate of tool advance per revolution. If the speed is kept constant, then doubling the feed doubles metal removal rate.

It is well established that heavier feeds increase the amount of metal that can be removed before a tool fails, except at extremely high speeds.

Up Both Ways—For instance, Field and Zlatin show the effect of increasing the feed on the tool life of A-8640 steel to be as follows:

Speed	Feed (ipr)	
	0.005	0.010
300 sfm	60 cu. in.	155 cu. in.
500 sfm	40 cu. in.	100 cu. in.

In these experiments increasing the speed by 60 per cent shortened tool life by one third. On the other hand, doubling the feed, from 0.005 to 0.010 inch per revolution, at either 300 or 500 sfm actually increased tool life by 150 per cent. The actual figures are not important, the conclusion is. It is much better to increase metal removal rates by increasing feeds than by using high speeds. Longer tool life results in fewer delays for tool changes and more production per shift.

Here's Why — Most reasonable explanation for this speed versus feed condition is that higher speeds have a greater tendency to raise cutting temperature than do heavy feeds, and that these high temperatures influence tool life.

Chart shows some data obtained by Chao and Trigger of the University of Illinois. Their data permit three conclusions to be drawn: Doubling the speed raised the tool-chip temperature about 200° F. Increase in temperature for increases in speed is independent of feed.

Doubling the feed, for any of the speeds shown, increased the cutting temperature only about 60° F. Thus, doubling the production rate by changing feed instead of speed results in only about one-third the increase in cutting temperature. How important is this as to tool wear? Increasing the temperature from 1100 to 1300 lowers the strength of high-speed steel from 400 to 200 Brinell, according to work by Harder.

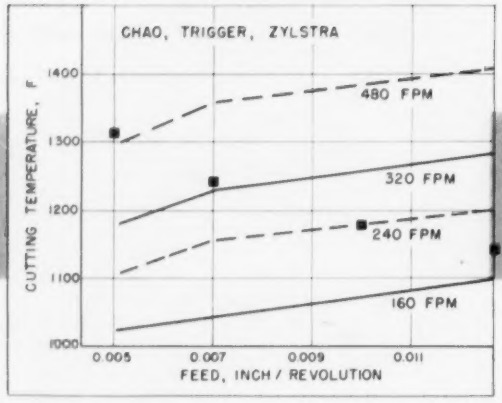
POINTS FOR EFFICIENT CUTTING

1. Keep the tool cool
2. Lubricate tool as well as possible
3. Boost feeds rather than speeds
4. Choose steel with highest average machinability rating within limits of mechanical properties required
5. Select best recommended tool shape for operation performed

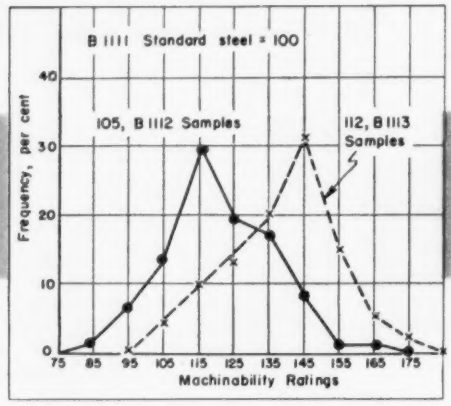
Two Keys—First point to remember for efficient cutting is to use the heaviest feed permitted by the workpiece and the machine tool. Second, remember the cutting temperature data correlate with the effects of speed and feed on tool life.

What Happens—In the simplest type of metal cutting, that using a single-point tool, the tool presses into the work and removes a chip. The chip is thickened, strained and work hardened as it slides across the tool. Part of the workpiece rubs against the end of the tool. The chip also rubs against the tool face. Heat is developed by all three actions.

About 99 per cent of the useful work expended in cutting is converted into heat. This can be shown by cutting in a calorimeter and



Temperature is affected less by feed than by speed



Machinability ratings vary for the same steel

comparing the energy put in as mechanical work to the energy liberated as heat. Some of the heat goes into the chips and workpiece, but the part transferred to the tool is most important.

Contention—I feel that the frictional properties of a metal, and its strength in the actual cutting operation, control machinability of the metal.

It seems to me that almost half of the heat generated by friction at the tool-chip interface can be transferred to the tool. This softens the tool, lowers its abrasion resistance and shortens tool life as well.

Test Method — Machinability studies were made at Battelle on a constant-pressure lathe. On this lathe the tool carriage is not connected to the fixed-feed mechanism of the machine, but the thrust pressure on the tool is applied by hanging a weight on a cable connected through pulleys to the drum behind the hand wheel. The torque caused by the weight is transmitted to the carriage by a rack and pinion.

Load controls the thrust or horizontal pressure on the tool.

Since, as shown in the accompanying sketch, frictional force of the chip against the tool must balance the force pushing the tool into the workpiece, measurements of thrust forces on a tool and the resulting feeds will show the frictional characteristics of the metal in a cutting operation.

Variables—Feed obtained in the test for a given thrust depends on the steel and the testing conditions. During a test, it is necessary to control the tool shape and condition, thrust pressure, depth of cut, and surface speed of the work. Therefore, the feed can vary with the machinability of the metal being tested.

Ample power is available for cutting, but the feed is controlled by the friction of the chip sliding over the top face of the tool. Therefore feed varies with the frictional properties of the metal. Ratings with the constant-pressure lathe are based on the assumption that the steel which cuts faster has the better machinability.

CONCLUSIONS

1. **Machinability is determined only by a cutting test. Hardness and the rest are unreliable for this purpose**
2. **One cutting test doesn't tell the story. What's best for turning may not be good for drilling**
3. **Of machinability factors to be appraised, friction is most important**

Tie-in—Although practically no tool wear occurs in the constant-pressure test because the tools are reground frequently, the indexes from this test check the machinability ratings from the tool life tests.

This indicates that friction, which controls the feed in a constant-pressure test, also controls tool wear in tool breakdown tests.

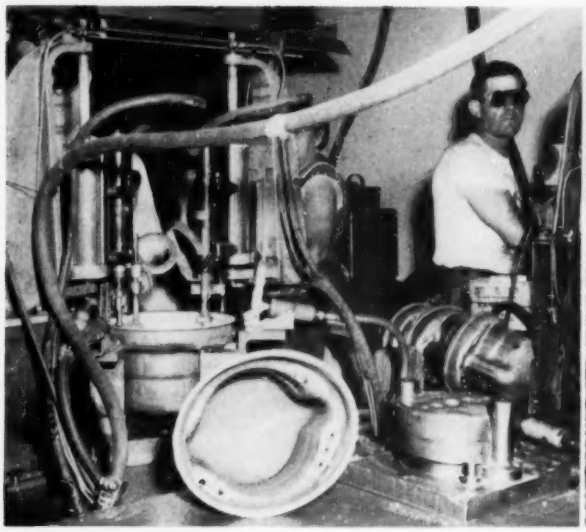
Better Cutting—The best way of improving machining properties of a metal is to add an internal lubricant. Sulphur and lead both act as lubricants and high sulphur and leaded steels are both free cutting.

Leaded steels, developed at Battelle, are now regarded as one of the best free-cutting series on the market.

Controllers—Composition, segregation, inclusions and microstructure of the metal all affect machinability.

Furthermore, variation of any one of these can change the under-cut action of the metal. This accounts for variations in machinability for bars of the same chemical and physical specifications—and even for bars from the same furnace heat.

Differences in microstructure can be produced by variations in cooling rate or in hot working temperature. They are often more important in forgings than in wrought steels. For this reason, better control of forging and heat treating operations often pays off in subsequent machining operations.



Using progressive techniques, men behind welding units load and weld studs; next man on each line inspects; then ferrules are knocked off and housings are rustproofed

Two Nelson stud welders are seen in compressor housing production at Bingham Stamping. The company reports its direct fastening costs were reduced by about 30 per cent

STUD WELDING:

FASTENING COST TAKES 30 PER CENT CUT

Semiautomatic equipment interjects mass production technique at Bingham Stamping. Warpage, locating and cleaning problems go by the boards

A SWITCH in fastening methods means a production bonus for Bingham Stamping Division, Bingham-Herbrand Corp., Toledo, O.

Compressor housings used in domestic air-conditioning units are made in two parts, stamped out on 600-ton presses. Two Nelson shoulder-type threaded studs, used to support the compressor unit, are welded to a ledge or shelf on the inside of the larger stamping.

Formerly, specially - machined studs were hand arc welded to the ledge. This method presented warpage, locating and cleaning problems which resulted in an excessive number of rejects. In addition, because of time required for welding, utilization of mass production techniques was virtually impossible.

Revised Line—Special granular flux-filled studs are used with two twin-gun Nelweld production units installed on a revised production line. With the semiautomatic stud welding equipment, direct fastening costs were reduced immediately by 30 per cent. Housings are now stud welded at an average rate of $3\frac{1}{2}$ per minute (192 units per hour), compared with the more than 2 minutes formerly required for each housing. In addition, warpage, stud locating and alignment problems have been completely eliminated. Result: End product is much cleaner.

How it Works—Each of Bingham's two production lines operates in the following manner. After three thermal bushings are projection-welded onto the housing, it moves to the operator of the stud welding unit who places the housing in a locating fixture below the guns. He then loads a stud and ceramic ferrule into the chuck of each gun and presses a button which automatically clamps the piece, moves the guns down to the housing and welds the studs. Latter operation takes only a split second. Guns then automatically return to normal position.

Next man taps outside of housing with a hammer to remove ferrules. An inspector examines the piece and passes it on to a worker who wipes out the inside of the housing. Finally, housing is dipped into a rust-preventive solution, ready for shipment.

WHY IT PAYS TO BUY STEEL FROM WAREHOUSE

You don't risk inventory losses when specifications change!

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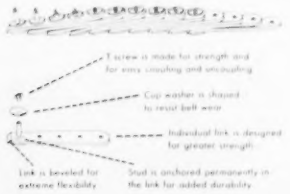
NEW PRODUCTS and equipment

Reply card on page 95 will bring you more information on any new products and equipment in this issue

Adjustable V-Belt

. . . easy coupling and uncoupling

Adjustable v-belt for D and E drives is designed to make coupling and uncoupling easy. Link v-belts are made of plys of specially-treated high-tensile strength


T screw is made for strength and for easy coupling and uncoupling
Cup washer is shaped to resist belt wear
Individual link is designed for greater strength
Link is beveled for extreme flexibility
Stud is anchored permanently in the link for added durability

canvas duck, joined by riveted studs with removable cup washers and T-screws. Result is high strength and durability at all key points.

Two types are available: Regular rubber coated for general service; oil-proof for oily and high-temperature drives. Application to metalworking includes use on large machine tools, presses, shears, rolls, air compressors, etc. Manheim Mfg. & Belting Co., Dept. ST, Manheim, Pa.

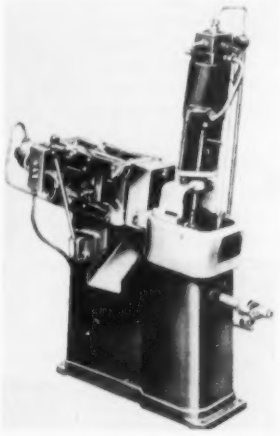
FOR MORE DATA—CIRCLE REPLY CARD NO. 1

Independent Die Conveyor

. . . downtime: 2 to 3 minutes

A new feature of the IMP/96 die casting machine is an independent die unit which can be completely removed. DCMT made this unit standard on all machines when they determined that 90 to 95 per cent of down time was experienced during die change or repair. Die unit can be lifted off the machine and a spare, with die mounted, can be installed. The machine can be back in operation in a period of 2 to 3 minutes.

The continuous operation attained through the use of this die unit, coupled with the high cycling speed of the DCMT machine (800 to 1000 shots per hour) permits use of low cost single or two-cav-



ity dies to meet production requirements. DCMT Sales Corp., 164 Duane St., New York 13, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 2

Double Chamber Furnace

. . . tank, generator made to fit

Double-chamber electric furnace, with controlled atmosphere, is 12 x 12 x 20 inches, with quench tank

and atmosphere generator made to specification. Gages for proportioning gas and air are located at the side. Furnace has a gas curtain and a piloted outlet for the atmosphere gas.

High-temperature furnace has a foot-operated door; drawing furnace has a swinging door. Waltz Furnace Co., Dept. 9, Symmes St., Cincinnati, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 4

Aluminum Roofing, Siding

. . . reduces metal by 50 per cent

An aluminum roofing and siding product is reported to reduce by 50 per cent the amount of metal normally used in side laps with conventional metal sheets. The 8-V Crimp roofing and siding material makes possible substantial metal savings, as well as economy of handling and installation costs. Two 12-foot lengths make one square of the material.

Roofing and siding is available in 0.019-inch 26-gage and 0.024-inch 24-gage sheets. Both gages are available in all standard lengths from 6 to 12 feet, in one-foot increments. Reynolds Metals Co., Dept. ST, 2500 S. Third St., Louisville, Ky.

FOR MORE DATA—CIRCLE REPLY CARD NO. 5

Extinguisher Supply Indicator

. . . no periodic manual checks

This fire safety device continuously indicates whether CO_2 fire extinguishers are full or emp-

ty. Known as the Silent Sentry, the device serves as a mounting bracket and continuous weigher

PREVENTIVE MAINTENANCE

eliminates truck downtime

READY-POWER IS *BEST* FOR PREVENTIVE MAINTENANCE

Tie up a truck because of power failure? Never! Equip your fleet with *interchangeable* Ready-Power gas-electric units and, then, have one extra for the shop. Thus, power units can be rotated for preventive maintenance . . . and your trucks stay *on the job* . . . where they belong.

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3824 Grand River Ave., Detroit 8, Michigan

Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electric Power Units for Industrial Trucks

NEW PRODUCTS and equipment

for all standard CO_2 extinguishers. A collar fastens around neck of the bottle and permits instant use of extinguisher.

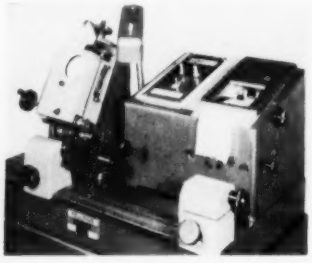
Because the unit shows condition of extinguisher at all times, it eliminates expensive manual inspection and weighing. Mel-Rod Mfg. Co., Dept. ST, 11616 Hart St., N. Hollywood, Calif.

FOR MORE DATA—CIRCLE REPLY CARD NO. 6

Fine Pitch Gear Checker

. . . provides composite check

Red Liner fine-pitch gear checker provides type of measurement designated by AGMA as a composite check, by which all errors are measured in combination. Errors in gear tooth elements cause



changes in velocity or in center distance, and latter principle is the basis on which this checker operates. Simple adjustment extends amplification through 200 to 1, 400 to 1 or 800 to 1.

The instrument will measure gears of 20 pitch and finer up to 4 inches pitch diameter, external or internal. Fellows Gear Shaper Co., Dept. ST, Springfield, Vt.

FOR MORE DATA—CIRCLE REPLY CARD NO. 7

A-C Motor Line

. . . 1, 1½ and 2-hp applications

Line of squirrel-cage induction motors, built to recently-adopted NEMA standards, includes pro-

USE A REPLY CARD

Just circle the corresponding number of any item in this section for more information.

INFORMATION

AVAILABLE FOR THE ASKING

70. Strain Gage

Baldwin-Lima-Hamilton Corp.—The improved Whittemore strain gage is described in an illustrated, 2-page bulletin 4207. It gives features and specifications of this hand type, dial micrometer instrument for 2 and 10-inch gage lengths.

71. Tube Fittings

Parker Appliance Co.—Catalog No. 4370 presents a new line of socket type Weld-lok tube fittings for permanently welded joints. Fittings are available in steel or stainless steel for all commonly needed body shapes. Line includes unions, adapters, connectors, tees, crosses, gage connectors and elbows for applications involving extreme temperature conditions or for permanently welded tubing circuits.

72. Refractory Products

Johns-Manville—Up-to-date edition of 40-page industrial products catalog offering data on insulations, refractory products, asbestos cement pipe, packings, gaskets, electrical products, frictional materials, roofing, siding, flooring, partitions and ceilings has just been issued.

73. Instrument Transformer Line

General Electric Co.—Buyer's Guide of up-to-date information on the complete General Electric instrument transformer line now available. Fully-illustrated, the 96-page guide contains ratings, ASA accuracy classifications and prices of all G-E indoor and outdoor potential and current transformers. Also includes listings of ration and phase-angle tests.

74. Pipe Installation

American Gilsonite Co.—Tips on installation of Gilsulate, the triple-zone insulation for hot underground pipes, are given in a 4-page illustrated publication. In contact with hot pipes Gilsulate forms a triple zone of insulation that provides permanent thermal insulation and corrosion protection. In addition to being an insulator, the insulation protects pipes against corrosion.

75. Belting Reference

B. F. Goodrich Co.—Rubber transmission belting catalog just published describes and illustrates construction features of various industrial belts with recommended usage. A special section is devoted to oilproof belts.

76. Collet, Chuck Reference

Rivett Lathe & Grinder, Inc.—A new collet and chuck bulletin, No. 100E, emphasizes the fact that precision depends not only on the quality of the machine, but equally on the method of mounting the work now available. Data and specifications are grouped for quick reference.

77. Sharpening and Conditioning

Staples Tool Co.—A Shop Manual just issued, provides users of carbide-tipped reamers with valuable data on sharpening and tool conditioning. Manual covers data on chamfer sizes, recommended clearance angles, method of repair and special sharpening techniques. Illustrated with data on recommended diamond wheel type and sizes and a tabulation of sharpenings for reaming most materials.

78. Anti-Corrosion Alloys

Cooper Alloy Foundry Co.—An article discussing in detail the cast corrosion resistant alloys most generally used for process equipment in the chemical industries has been written by E. A. Schoefer, Executive Vice-President, A.C.I. Tables indicating physical and mechanical properties of cast corrosion resistant alloys, standard designations and chemical composition ranges for heat and corrosion resistant castings are included.

79. Thermocouples

Foxboro Co.—A new edition of the 36-page bulletin, "Thermocouples and Accessories" now available. Listed, with specifications, are standard thermocouples for all applicable tempera-

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ture ranges. Separate sections are devoted to the tubular-type iron-constantan couples, wire-type iron-constantan and copper-constantan couples, and Chromel-Alumel alloy and platinum couples. Illustrated with dimensional drawings of complete assemblies.

80. Machine Mounting Pads

Felters Co.—Description of the use of Unisorb mounting pads is found in 8-page booklet. Questions having to do with use, elimination of bolts, reduction of transmitted machine vibration and relative cost of the method are answered.

81. Raw Materials Handling

Salem-Brosius Inc.—Auto-floor furnace charging machines, designed in eight models for handling raw materials and shapes weighing up to 20,000 pounds are described in a 12-page illustrated brochure. Self-powered, it operates at floor speeds up to 250 fpm and does a complete stock handling job without auxiliary materials-handling equipment.

82. Metal Preservatives

American Chemical Paint Co.—Checklist of metal protective and paint bonding chemicals and processes has been released. It provides quick reference guide to chemicals and processes for metal preservation.

83. Aluminum Electroplating

Reynolds Metals Co.—The "Technical Advisor" just issued contains an article detailing recent developments in electroplating on aluminum. Factors affecting aluminum plating, standard processes and the latest recommended procedures are given, plus a question and answer section. Also contains an article on various chemical finishes for aluminum.

84. Selenium Rectifier

Hanson-Van Winkle-Munning Co.—4-page, two color bulletin ER-105 describes and pictures a new heavy-duty, selenium rectifier specially designed for use in plating and other metal finishing operations. It tells what type of current and ripple is delivered by the rectifier and gives information on models available, costs, operating capacity, various sizes, type of input and kind of current switching. Illustrated.

85. Hammer Mill

Schutte Pulverizer Co.—The Schutte instant-screen-change hammer mill is described in a 4-page, illustrated bulletin just published. Outstanding features are described in detail. Contains a complete table of capacities, dimensions and weights of the five models available as either belt-driven or direct-driven units.

86. Cutting Tools

DoAll Co.—A wide variety of carbide tipped single point cutting tools is described in new 12-page brochure. Standard unground carbide tips as well as carbide tips for threading tools, reamers, scrapers, etc., are shown. Solid carbide inserts and carbide tips for lathe and grinder centers listed with data on producing chip-control grooves on cutting surfaces of carbide tools.

EDITORIAL REPRINTS:

87. Powdered Metals

For the first time, says W. L. Batten, Vanadium Alloys Steel Co., in a STEEL article, powdered metals enter the stainless stage and steadily gain prestige. The powders are available in grades 302-B, 316, 318, 318-Si and 410. The patented process melts and disintegrates alloy steels to achieve complete homogeneity.

88. Dry Lubricant Coating

A dry-thin-film lubricant replaces lime coating and results in trebled draw bench production. An article in STEEL describes how, by replacing conventional lime coating practice with a dry thin-film lubricant, one plant increases production with 3-die draw benches. Speeds go up to 150 fpm.

89. Bronze Plating

Three metalworking experts join forces to describe one nickel-shortage substitute that will outlive the shortage days. The article in STEEL reports that bronze plate on bearing surface shows up better than solid bronze. Some other uses are: Decorative finish, salvaging mismachined parts, electroforming, stop-off in surface hardening.

90. Induction Billet Heating

West Penn Power Co. engineers think that induction heating methods may speed heating of steel billets for rolling. An article, published in STEEL, describes how the Penn setup lets steel operators try 60-cycle heating for large rolling billets. Lower installations costs, ease of control and cleanliness are prime advantages.

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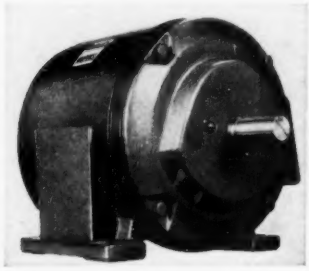
tected and enclosed motors for all industrial purposes. The totally-enclosed fan-cooled motors are built to operate under a wide variety of adverse atmospheric conditions and in any mounting position.



First of the line to appear will be built for 1, 1½ and 2-hp applications, in frame sizes 182 and 184. Reliance Electric & Engineering Co., Dept. ST, 1088 Ivanhoe Rd., Cleveland 10, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 8

Three-Method Microfilmer

. . . standard, duo, duplex types

Three methods of microfilming, five different reduction ratios and a choice of 16 or 35mm film are

available with this microfilmer. The methods include standard, duo and duplex. Interchangeable lens assemblies provide reduction ratios

USE A
REPLY CARD
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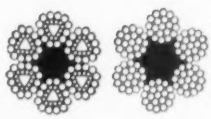
PROVING EXTRAORDINARY SERVICE—A Hercules Flattened Strand crane rope delivered 18 months service, compared to 6 months for ordinary rope. It performed equally well as a clamshell bucket rope. On a hot ladle crane it outlasted round strand rope by 4 to 1. It was chosen for its super strength to haul the car on the continent's largest cableway at Kitimat.

Can Flattened Strand solve your special wire rope problem?



Flattened Strand Round Strand

Hercules Flattened Strand is a special kind of wire rope that provides extraordinary service on special kinds of jobs.

The key to the difference is the triangular shape of the strands. Notice how the strands support each other; how the rope circumference is almost perfectly round; and how the core is smaller. There is 10% more steel in Hercules Flattened Strand than in round strand ropes of the same diameter. That means *10% more strength* and *10% greater safety*. Flattened Strand wears longer and more evenly...and is easier on sheaves and equipment.

If you can use this Super-rope, you'll soon begin saving time, labor, money. Why not investigate?

Because Leschen pioneered and perfected Hercules Flattened Strand wire rope, Leschen is your best source of additional information. Ask your Leschen man, or write for "The Flattened Strand Story."

LESCHEN WIRE ROPE DIVISION
The Watson-Stillman Company
(A SUBSIDIARY OF H. K. PORTER COMPANY, INC.)
St. Louis 12, Missouri

LESCHEN
HERCULES Red-Strand
WIRE ROPE

of 40, 32, 25 and 20 to 1, using 16mm film. At a reduction ratio of 18 to 1, 35mm film can be employed with the duplex method.

Automatic feeder feeds over 500 checks and small card-size records or 200 letter-size documents per minute. All operating controls and components are located above desk level. A single switch sets all parts in operation. Recordak Corp., subsidiary of Eastman Kodak Co., Dept. ST, Rochester 4, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 9

Combination Handler

. . . for pallets, drums, boxes

Combination pallet, drum and box handler widens scope of truck handling activities. Lever controls enable the operator to vary fork

spread hydraulically between 18-inch minimum and 62-inch maximum centers. This arrangement makes it possible to handle a wide variety of pallet sizes and load types.

Combination attachment can be installed on all the manufacturer's hydraulic fork trucks. Yale Materials Handling Division, Yale & Towne Mfg. Co., Dept. ST, Philadelphia 15, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 10

Touch-Up Enamel

. . . available in spray cans

O-D touch-up enamel, conforming to MIL specifications for interior and exterior metal containers, is now available in convenient spray cans. Result is elimination of set-up for complete spray job when only a spot touch-up is necessary. It makes fast work of covering scratch marks and incorrect stencil markings.

To use, simply remove cap and apply pressure. Intensity of spray

can be regulated by pressure of finger. Greenwood Packaging Supply Co., Dept. ST, 857-859 Winter Ave., Newark, N. J.

FOR MORE DATA—CIRCLE REPLY CARD NO. 11

Cobalt-Base Spring Alloy

. . . back on commercial market

Elgiloy, cobalt-base spring alloy, is back on the commercial market after being absent since 1950 because of restrictions on use of cobalt and nickel. Principal composition: Cobalt, 40 per cent; chromium, 20 per cent; and nickel 15 per cent.

The alloy is available in three forms. Manufacturer will supply it in raw stocks, heat-treated or completely fabricated into parts made to specifications. Abrasives Division, Elgin National Watch Co., Dept. ST, Elgin, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 12

Corrosion Resistant Steel

. . . takes 100-hour salt spray

Improved AISI 420 corrosion-resistant steel Rollpin is capable of withstanding a 100-hour salt spray test. Processing methods, including passivation, enable this steel to meet requirements of AMS 7207.

Product is a slotted and chamfered cylindrical spring pin, heat-treated to achieve optimum toughness, resilience and shear strength.

Design proportions are engineered so self-locking action is achieved in holes drilled to normal production tolerances. Typical uses include pinning gears or pulleys to shafts, hinge pins, dowels, replacements for cotter pins and as shafts for small gears. Elastic Stop Nut Corp. of America, Dept. ST, Union, N. J.

FOR MORE DATA—CIRCLE REPLY CARD NO. 13

Gray Metal Primer

. . . simple surface preparation

Self-spray gray metal primer has zinc chromate base, is used for painting all metal surfaces to simplify preparation of surface for refinishing. It is available in a

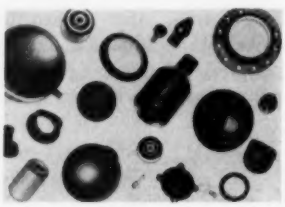
12-ounce can with self-spray attachment. Plasti-Kote Inc., Dept. ST, 425 Lakeside Ave. NW, Cleveland, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 14

Molded Silicone Rubber

. . . tolerance to 5 microfinish

Custom-molded silicone rubber parts, produced to commercial and government specifications by transfer, injection and compression molding have been added to this manufacturer's line. Complete service includes compound formulation,



mold-making facilities and rubber-to-metal bonding to tolerances as close as 5 microfinish. Stillman Rubber Co., Dept. ST, 5811 Marilyn Ave., Culver City, Calif.

FOR MORE DATA—CIRCLE REPLY CARD NO. 15

where only the right steels work

J&L sheet and strip

Your particular requirements for formability, uniformity, and drawing qualities determine every step in the production of your order of J&L Sheet and Strip.

An understanding of product end use, and the physical and chemical properties required to do the job, are the foundation for J&L quality control practices. And J&L quality control assures accurate adherence to your specifications.

You can depend on J&L for Sheet and Strip Steel that helps you get the best out of high speed production equipment . . . adds to the value of your finished product.

serving steel users everywhere —

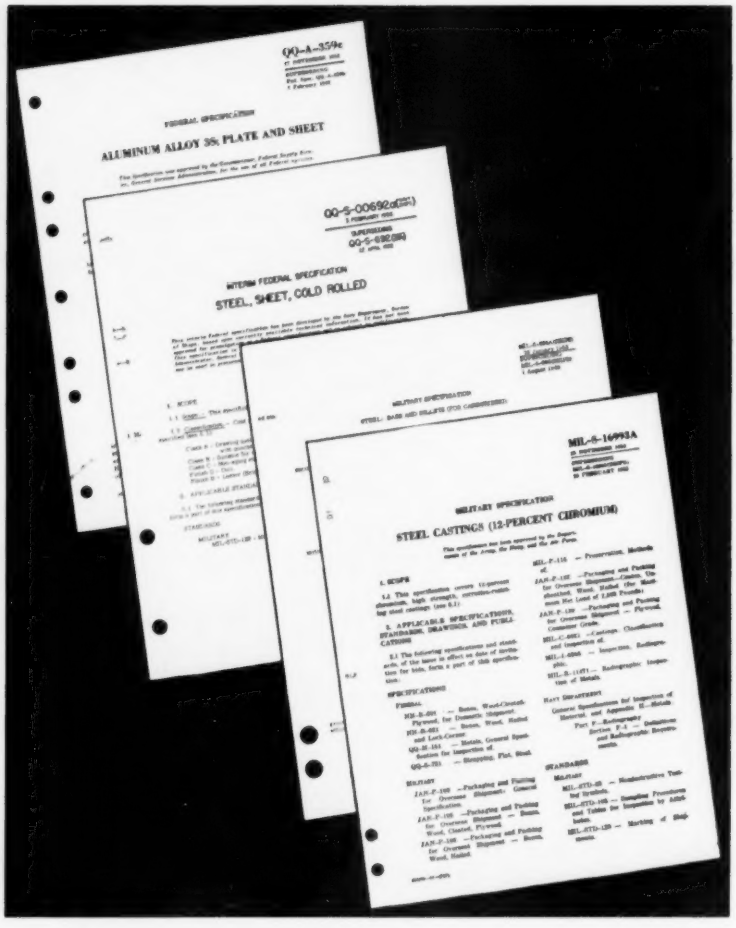
linked by water to the Middle West and South

J&L's nation-wide distribution is supported by its location and facilities for prompt, dependable river, rail and truck shipments.

Jones & Laughlin

STEEL CORPORATION — *Pittsburgh*

J&L STEEL



Know Your A, B, C's . . .
OF GOVERNMENT SPECIFICATIONS

Those used by military departments soon will be limited to two series: Federal and military. Here's a chance to brush up your understanding of the specs system

By DR. ALLEN G. GRAY
Technical Editor

IF YOU DO business with the government—and who doesn't—you'll find it will pay to understand the meaning behind specification language.

Federal and military specifications, usually referred to as government specs, are of interest to everyone having material, equipment or services to sell to the government.

These two series of specs are going to become more important in procurement circles because all individual activity specifications (Navy, Army and Air Force) are being combined and incorporated into the federal or military series as rapidly as possible. Less, not more, specifications is what Uncle Sam's buyers are planning for.

Definition — "A specification is intended to be a clear and accurate description of the technical and physical characteristics or performance requirements of the material or equipment, including preparation for delivery and procedures by which it can be determined that the requirements have been met."

That's how Margaret P. Haskin, who has 11 years experience in the Specifications and Standards branch of Bureau of Ships, defines government specifications in a report for industry.

FEDERAL

Federal specifications, (originally known as U. S. Government Master specifications) cover supplies and materials used by two or more Government departments —at least one of which is civilian. They are administered by the director of federal supply, General Services Administration; and

copies may be obtained from GSA, Business Service Center, Region 3, Seventh and D Streets, SW, Washington 25.

Single copies of federal product specifications required for bidding are available without charge at the GSA Regional Offices in Boston, New York, Atlanta, Chicago, Kansas City, Mo., Dallas, Denver, San Francisco, Los Angeles, Seattle and Washington.

Essentials — Federal specs are identified by a symbol that has three parts: 1. An arbitrarily assigned single, double or triple letter indicates the federal "group for procurement." Examples: H-brooms and brushes; FF-hardware; QQ-metals; WW-pipe, pipe fittings, tubes and tubing (metallic). 2. A single letter is the first letter of the first word in the title. Example: Symbol covering "steel, corrosion-resisting; bars and forgings" is QQ-S-763; WW-T-790 covers "tubing seamless aluminum;" FF-P-101 related to "padlocks." 3. Number following letter is a serial number determined by alphabetical location of the title.

Types — Federal specifications fall into three types: 1. Those approved for use by all government departments are Regular. 2. Those issued by an individual governmental agency—to satisfy an immediate need—are Interim. 3. Those designed to conserve critical materials are Emergency.

Interim federal specifications are intended for final processing as regular federal specifications. Prior to coordination they are identified by the basic symbol prefixed with double zero (00) and carry a suffix to identify the issuing activity. Example: GGG-B-00211 (Navy Ships)—Bevels.

Preamble on first page of interim specifications explains significance of the specification, and it will tell if it is intended to supersede an existing regular federal specification when it is coordinated.

Same Number — Emergency specifications carry the same number as the basic specification; however, the basic number will be prefixed with a zero. Example:

H-B-0256a
15 May 1951

Emergency federal specs do not modify or supersede basic specifications, but they are issued in addition to them. They will be used as an alternate, whenever possible, to conserve materials.

When emergency specifications are issued, a notice is published that calls attention to the optional specification and the material it is intended to conserve. Notice carries same number as basic specification. Underneath the number appears the notice number and date:

H-B-491b
April 3, 1945
NOTICE 2
November 14, 1951
SUPERSEDING
NOTICE 1
October 5, 1951

Revisions—Revision of a federal specification supersedes the previous issue, including any amendments. For regular specifications revisions are indicated by the addition of a small letter—a,b,c, etc. —to the symbol in the upper right hand corner of the first page. Here's how it applies to QQ-B-746a—a revised specification for procurement of bars, plates, rods, shapes, sheet and strips of phosphorus bronze:

QQ-B-746a
October 8, 1950
SUPERSEDING
Fed. Spec. QQ-B-746
June 5, 1934

Minor changes in a federal spec are made by amendment. Amendments bear specification number, amendment number and date of amendment in upper right hand corner. Only one amendment is in effect at any one time. Changes in a superseding amendment include all changes to the date of issue of specification. Superseding amendments are indicated by the figure 2, 3 etc.:

J-C-103
Amendment-5
May 27, 1950
SUPERSEDING
Amendment-4
April 4, 1947

SUFFIXES USED FOR IDENTIFICATION OF MILITARY SPECIFICATIONS

ARMY

CmlC	Chemical Corps
CE	Corps of Engineers
Med.	Army Medical Service
Ord.	Ordnance Corps
QMC	Quartermaster Corps
SigC	Signal Corps
TC	Transportation Corps

AIR FORCE

USAF	Department of the Air Force
ASG	Aeronautical Standards Group

NAVY

Navy	Department of the Navy
Aer.	Bureau of Aeronautics
MC	Marine Corps
BuMed	Bureau of Medicine and Surgery
NOrd.	Bureau of Ordnance
Pers.	Bureau of Personnel
Ships	Bureau of Ships
S&A	Bureau of Supplies and Accounts
Docks	Bureau of Yards and Docks

MILITARY

Military specifications—formerly known as Joint Army-Navy (JAN) specifications—cover materials, products or services used solely or predominantly by military activities. While the use of these specifications is required only for military activities, they may be used by other federal agencies.

Office of Standardization, Washington, now has the responsibility of administering military specifications. It also is the authority for developing the highest degree of practical standardization of all items used by the armed services.

Types—There are two types of military specifications: Coordinated; Limited Coordination. Coordinated specifications are agreed on by all interested activities of the three military departments and cover items of common use. Limited coordination specifications are those of single departmental interest or those prepared by a department to satisfy an immediate procurement need.

Coordinated specifications have three-part symbols: The letters "MIL" (abbreviation for military) followed by a single letter (which is the first letter of the first word in the title) and a serial number. Example: Symbol for specification covering "steel, alloy castings for aircraft use" is MIL-S-(for the

FEDERAL AND MILITARY SPECIFICATIONS . . . WHAT THEY TELL YOU

Federal Specifications are divided into seven sections, Military into six

FEDERAL	MILITARY
1. Scope and classification	1. Scope
2. Applicable specifications, other publications and drawings.	2. Applicable specifications, standards drawings, and publications.
3. Material requirements	3. Requirements
4. Sampling, inspection and test procedures.	4. Sampling, inspection, and test procedures.
5. Preparation for delivery	5. Preparation for delivery
6. Notes	6. Notes
7. Departmental requirements	

Section 1—General information on the extent of applicability of the product or service covered.

Section 2—Listing of documents referenced in specification and where to get copies.

Section 3—Details on quality of materials by specifying the formula, design, construction, performance, physical requirements, dimensions, weight, color, as necessary. Also, covers as definitely as possible, standard of performance, quality and workmanship which the commodity must meet to be acceptable. If qualification approval is required this section will say so.

Section 4—Gives complete information on methods and frequency of sampling, inspection, and tests to determine conformance of products.

Section 5—Covers requirements for preserving, packaging, and packing.

Section 6—General notes and information on what is to be incorporated in invitations for bids, contracts or other purchase documents.

Section 7—(Federal only) Details on requirements that are special for individual departments.

word steel) 6014 (for the serial number).

As existing specifications carrying the prefix "JAN" are revised, the prefix is changed to "MIL," although the number remains the same.

Identified—Limited coordination specifications are identified by a suffix to the basic symbol. This suffix identifies the activity issuing the specification. Example: Specification for "tubing, copper seamless," has the designation, MIL-T-873(SHIPS). Activity issuing this specification is Bureau of Ships.

Table I gives a complete list of suffixes used for identification of limited coordination specifications. If a limited coordination specification later becomes fully coordinated, it will be identified by the same basic symbol without the suffix.

Obsolete—In some cases, where a coordinated specification of general use becomes obsolete and revision is delayed, it may be necessary to issue a limited coordination specification to cover changes needed for immediate use. To avoid the confusion caused by issuance of a limited coordination specification of the same title under a new number, such a specification may be issued under the original number.

The limited coordination specifications, in addition to the regular identification, will carry the notation "used in lieu of" where the supersession information is ordinarily carried. In addition, the symbol will be prefixed with a double zero (00). Example is:

MIL-R-0016847C(SHIPS)
March 6, 1953
Used in Lieu of
MIL-R-16847B
July 11, 1952

Changes—Revisions of military specifications are noted by a capital letter following the symbol and preceding any suffix. First revision will be marked with the letter A; succeeding revisions will be marked by other letters in alphabetical sequence—exception is that letters I,O,Q and S shall not be used. Example: MIL-W-1700A or MIL-W-1700B (SHIPS).

As in federal specifications, minor changes to military specifications are made by amendment.

A custodian from each of the military departments (Army, Navy and Air Force) is designated for each specification. Responsibility is to see that requirements of the specification will satisfy needs of their department. Custodianships are shown on the last page of the specification.

Who to Ask—Questions about military specifications listed in a contract should be referred to the purchasing officer. Questions about military specifications where there is no contract should be referred to the appropriate departmental custodian, interested bureau or service indicated in spec.

QUALIFIED PRODUCTS LISTS

Qualified products lists are issued by the government to give information on ability of manufacturers to supply products that meet specification requirements. They are issued *only* when the specification says that testing must be done before the contract is awarded.

Such requirements are necessary when unsatisfactory performance of the product in service may endanger lives of personnel or where complicated designs and the nature of time-consuming tests would delay delivery of product.

Meaning—Fact that a product was tested and included on a qualified product list is evidence only that a manufacturer can make a product of a type and grade that meets specification requirements. Inclusion on a list does not relieve manufacturer of obligation to maintain such quality.

Listing does not guarantee acceptance of product in any future purchase nor does it constitute a waiver of the requirements of the specification as to acceptance, inspection, testing or other provisions of any contract.

When Required — Specification will state if qualification is required. If so, Section 3 (see box) will say that the product furnished shall have passed qualification tests. Section 4 will state tests to be made. Section 6 will give the name and address of the activity responsible for qualification.

Qualified products lists are always open for products of additional manufacturers as they are submitted and tested. Government encourages manufacturers to arrange for tests on products they intend to offer.

Here's How—When a manufacturer wishes to furnish a product

covered by a specification requiring qualification approval, he should: 1. Review the specification. 2. Determine by tests whether his product falls within the performance or design limits of the specification.

He should then contact the activity responsible for qualification named in the specification and request a product test.

If approved for testing, the government activity will ask for the information they need and send directions for forwarding samples. If product meets qualification requirements, manufacturer will be notified and product will appear on the applicable products list.

Identified — Qualified product lists contain the government designation of the product, the manufacturer's designation, test or qualification reference and manufacturer's name and address—including address of the plant from which the sample was submitted.

Lists are identified by the symbol QPL followed by the number of the associated specification and a number to identify the issue of the list. Example: QPL-3125-1 indicates this is the initial issue of the list associated with military specification MIL-P-3125. QPL-P-R-791-2 indicates that this is the second issue of the qualified products list associated with the Federal Specification P-R-791.

Packing Specs Available

Complete sets of Government packaging and packing specifications most commonly used by small firms are now available for reference use in all field offices of the Small Business Administration, Wendell B. Barnes, acting administrator, announced today.

Mr. Barnes said that SBA, with the aid of military packaging experts, selected 324 Government packaging and packing specifications which are of greatest use to small business. These have been assembled into sets for ready reference, and a complete set has been supplied to each of SBA's 30 field offices.

The administration also has issued a leaflet, for free distribution, called "Packaging Pointers for Government Contractors," obtainable at any SBA field office.

New Books

Parts Fabricating Methods

FABRICATED MATERIALS AND PARTS—A Comparison of Cost and Design Factors by T. C. DuMond; cloth, 332 pages, 5¾ x 8¾ inches; published by Reinhold Publishing Corp., New York, for $6.50; available from STEEL, Penton Bldg., Cleveland 13, O.

Described in this volume are 20 major methods of making small industrial parts. Such considerations are discussed as costs, materials used, advantages, limitations, design factors and sizes and tolerances possible with each of these methods.

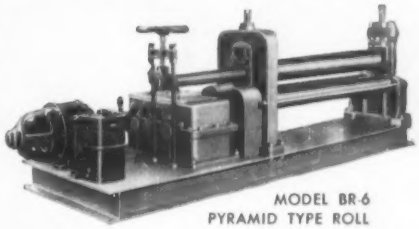
It is written specifically for the man who knows what his product must do, and enables him to find out quickly and easily what factors are involved in choosing the soundest, most economical method of manufacture. Of specific interest to the non-specialist are the introductory chapters which discuss the relationships between major production factors entering a practicable decision.

The book was written for the de-

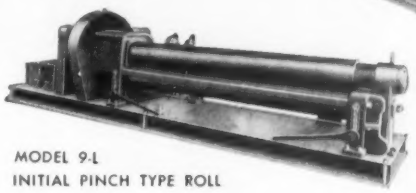
WEBB PLATE FABRICATING MACHINERY

PLATE BENDING ROLLS

The Webb Corporation offers a complete line of Plate Bending Rolls for the rolling of the thinnest plate up to plate 2½" thick. Offered in a variety of lengths and thicknesses. Constructed for the modern fabricating shop.



MODEL BR-6
PYRAMID TYPE ROLL

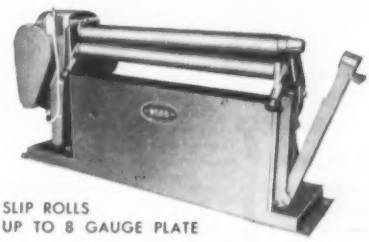


MODEL 9-L
INITIAL PINCH TYPE ROLL

Two types available: the Initial Pinch Type and Pyramid Type machines. All latest advantages of today's modern machine tools are incorporated, utilizing anti-friction bearings, totally enclosed gear drives. Special forming rolls for culvert pipe, stock tanks and other special shapes available.

SLIP ROLLS

A complete line of small Sheet Metal Forming Rolls are also available. All power-driven with shaft sizes 3" to 5" for the handling of the thinnest gauge material, up to 8 gauge material. Special rolls for the forming of polished sheets, aluminum and stainless steels can be furnished. Complete catalogues on any size machine furnished upon request; write Dept. D.



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UP TO 8 GAUGE PLATE

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PYRAMID TYPE ROLL

INITIAL TYPE ROLL

STEELWORKERS

Also Manufacturers of INDUSTRIAL WEIGHING EQUIPMENT

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WEBB CITY, MO., U. S. A.

sign, production, project or materials engineer, the purchasing agent and the executive, all responsible for how a part is produced.

Vibration Theory Discussed

MECHANICAL VIBRATION by G. W. van Santen; cloth, 296 pages, 6 x 9¼ inches; published by Philips' Technical Library, Eindhoven, Holland; available from STEEL, Penton Bldg., Cleveland 13, O.

Because most of the vibrations occurring in the different branches of engineering are of a detrimental nature, this close study of such effects, their elimination and also the present stage of research in this sphere was made. The author is attached to the development section of the Measuring Equipment Division, Philips Works, Eindhoven, and hence is daily confronted with such problems.

The theory involved in vibration phenomena is discussed in such a way that it can be readily assimilated by anyone having an ordinary knowledge of mathematics, and the results of the computations are presented in tables or charts.

This book will interest readers with problems arising from vibration or whose work entails measurement of vibration.

Electroplating Summary

MODERN ELECTROPLATING, edited by Allen G. Gray; cloth, 563 pages, 6 x 9¼ inches; published by John Wiley & Sons Inc., New York, for $8.50; available from STEEL, Penton Bldg., Cleveland 13, O.

Sponsored by the Electrochemical Society, this is a one-volume summary of current industrial electroplating practices. The book emphasizes the practical aspects of the science as well as the basic theory upon which its modern applications rest, and it reflects the numerous developments in electro-deposition for both the decorative and utility fields.

First principles are presented here, as well as advanced techniques in analytical control of solutions. Today's commercially available processes are documented in detail. The contents are as follows: General Principles, Methods of Control, Alloy Plating, Brass, Cadmium, Chromium, Cobalt, Copper, Gold, Indium, Iron, Lead, Nickel, Platinum, Silver, Tin, Zinc, Uncommon Metals, Plating on Aluminum and Magnesium.

Analysis Methods Compiled

METHODS FOR EMISSION SPECTROCHEMICAL ANALYSIS, sponsored by ASTM Committee E-2; cloth, 309 pages, 6 x 9¼ inches; published by American Society for Testing Materials, Philadelphia, for $5.15; available from STEEL, Penton Bldg., Cleveland 13, O.

This compilation is the result of a current program of the ASTM Committee E-2 on Emission Spectroscopy leading toward standardization of spectrochemical practices and methods.

In addition to suggested practices and suggested methods, there are included three tentative methods prepared by the committee, one tentative method of flame photometry for alkalis in cement, and a report on suggested nomenclature.

The intention in this book has been to present the pertinent information for each method to permit its application in various laboratories and with different types of equipment.

Particular emphasis has been placed on specifying spectral exposure conditions, excitation conditions, and analytical line pair data. In addition, the scope, limitations, precision, and accuracy have been recorded to the extent of data available, in order that methods can better be compared and evaluated with respect to other analytical methods.

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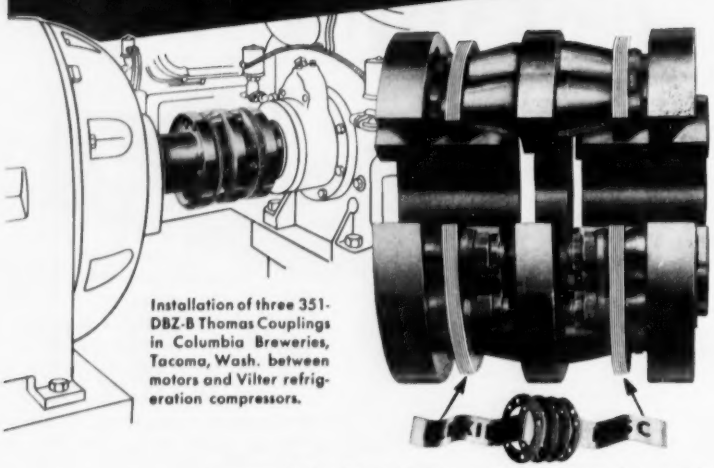

Installation of three 351-DBZ-B Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

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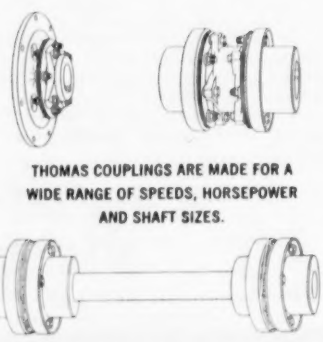
FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.



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Into these thundering, flashing electric furnaces go charges of scrap and other materials in proportions determined by your steel specifications. Newport's modern facilities and methods and their 68 years' experience in fine steelmaking take it from there. Electric power beats these ingredients into submission, chemicals float out the impurities, laboratories guide melters by frequent samples, and six hours of refining produces a heat which can be processed into exactly what you ordered. Newport continues to spend millions of dollars annually on the modernization and expansion program which makes this an ever better source for the most exacting buyer of steel.

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- Hot-Rolled Steel in Coil
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- Hot-Rolled Sheets
- Galvanized Sheets
- Galvannealed Sheets
- Colorbond Sheets
- Hot-Rolled Pickled Sheets
- Electrical Sheets
- Alloy Sheets
- Roofing and Siding
- Eave Trough and Conductor Pipe
- Culverts

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Newport Steel is situated on the Mississippi-Ohio River system and the great Cincinnati rail hub. With the advantage of location, new river barge facilities and seven major railroads, Newport gives economical, dependable delivery to industrial areas throughout the Middle West and South.

Newport Steel

CORPORATION

NEWPORT, KENTUCKY

STEEL

January 18, 1954

Market Outlook

PACE of steel demand has quickened since opening of the new year. But it leaves much to be desired in the way of order volume. Buying is spotty. In some products it is particularly disappointing. Consumers, playing it safe, are ordering sparingly and for requirements in sight. Some are working off inventories, which were larger than had been generally thought. The fact stocks have dropped to the point where replacement buying cannot long be deferred lends an encouraging note.

DISAPPOINTING VOLUME— The pickup in market activity is noticeably lacking in verve and spontaneity. This is especially noticeable in bars and plates and, to a certain extent, in sheets. Demand for merchant pipe, notably buttweld, still lags though no more than had been expected. Wire products are moving a little better than they were. There is open space in February schedules for most products.

STRIKING CONTRAST— Current demand presents a striking contrast with that prevailing at this time a year ago. Today, producers are actively seeking orders to fill out February schedules. In some items space still is available in January. Not even the auto builders and related consumers are exerting more than moderate pressure on the market despite their reported plans for large-scale first quarter auto production. A year ago mill books were overloaded.

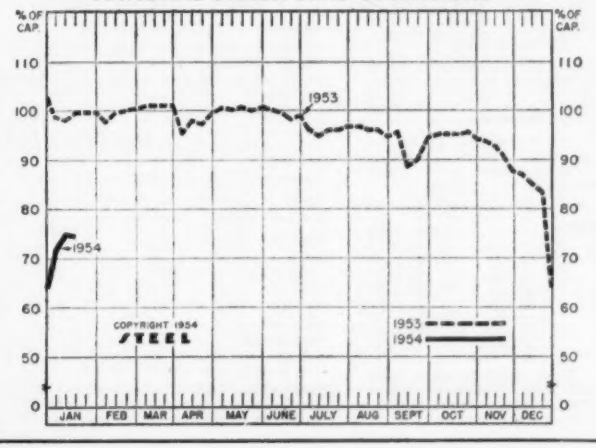
OPTIMISM PRESENT— Despite the current relatively sluggish appearance of the market, producers are confident demand will burgeon over the next few weeks. February bookings are seen bettering those of January, and current indicators point to highly satisfactory volume in March. Actually, bookings are comfortable and stack up favorably with volume in what would be considered normal years.

PRODUCTION— Steel output set a new record at 111,600,445 net tons in 1953. This is somewhat below published estimates, figured in December, but it is 18,432,406 tons more than were produced in 1952 and 6.4 million tons above the previous record set in 1951. Significantly, in the light of disturbing world political conditions, steel production in this country last year was equivalent to 44 per cent of total estimated world output of about 225 million tons.

OPERATIONS— Steelmaking operations declined slightly last week, the national ingot rate slipping a half point to 74.5 per cent of capacity. This was equivalent to output of about 1,775,000 net tons and compared with 1,900,000 tons a month ago, 2,248,000 a year ago. Too much significance should not be attached to comparative percentage operating figures since current industry capacity of 124.3 million net tons tops that of a year ago by almost 7 million tons. As much steel can be produced today at 83 per cent operations as could have been produced in 1951 at 100 per cent.

PRICES HOLDING— Except for continued weakness in scrap, the market is devoid of significant price developments. STEEL's composite on steelmaking scrap last week eased to $29.15 from $29.67 the preceding week and compares with $43 a year ago. Finished steel prices are steady with the arithmetical composite unchanged at $113.91.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged at leading production points)

	Week Ended Jan. 17	Change	Same Week 1953	Same Week 1952
Pittsburgh	88.5	— 1*	107	99
Chicago	77.5	— 3	105.5	103
Mid-Atlantic	82	0	94	101
Youngstown	78	— 2	106	106
Wheeling	82	0	101	100.5
Cleveland	88	+ 1.5*	102	102.5
Buffalo	65	—13	106.5	104
Birmingham	95	0	97	104
New England	67	— 8	89	85
Cincinnati	69	— 2	93	103
St. Louis	67	— 6	93	76
Detroit	86.5	— 6.5	104.5	103
Western	77	— 3.5	105.5	97
Estimated National Rate	74.5	— 0.5	99.5	97

*Change from preceding week's revised rate.

Weekly steelmaking capacity is estimated at 2,384,549 net tons in 1954; 2,254,459 tons in 1953, and 2,077,040 tons in 1952.

The Metalworking Outlook—p. 29 Technical Outlook—p. 77

PRICE INDEXES AND COMPOSITES

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics) Week Ended Jan. 12

Prices include mill base prices and typical EXTRAS and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.400	Bars, H.R., alloy	$8.675	Strip, C.R., stainless, 430 (lb)	$0.415	Tin plate, hot-dipped, 1.25 lb	$8.433
Rails, light, 40 lb	5.767	Bars, H.R., stainless, 303 (lb)	0.418	Strip, H.R., carbon	4.975	Tin plate, electrolytic, 0.25 lb	7.133
Tie Plates	5.125	Bars, H.R., carbon	4.873	Pipe, black, buttweld (100 ft)	14.454	Black plate, can making quality	6.233
Axles, railway	7.250	Bars, reinforcing	4.825	Pipe, galv., buttweld (100 ft)	17.731	Wire, drawn, carbon	7.713
Wheels, freight car, 33 in. (per wheel)	47.000	Bars, C.F., carbon	7.860	Pipe, line (100 ft)	141.960	Wire, drawn, stainless, 430 (lb)	0.545
Plates, carbon	4.550	Bars, C.F., alloy	11.075	Casing, oil well, carbon (100 ft)	149.516	Bale ties (bundle)	5.653
Structural Shapes	4.383	Bars, C.F., stainless, 302 (lb)	0.433	Casing, oil well, alloy (100 ft)	214.113	Nails, wire, 8d common	7.488
Bars, tool steel, carbon (lb)	0.415	Sheets, H.R., carbon	4.765	Tubes, boiler (100 ft)	‡	Wire, barbed (80-rod spool)	6.847
Bars, tool steel, alloy, oil hardening die (lb)	0.505	Sheets, C.R., carbon	5.904	Tubing, mechanical, carbon (100 ft)	‡	Woven wire fence (20-rod roll)	16.174
Bars, tool steel, H.R. alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.075	Sheets, galvanized	6.945	Tubing, mechanical, stainless, 304 (100 ft)	161.193		
Bars, tool steel, H.R., alloy, high speed W 18, Cr 4, V 1 (lb)	1.550	Sheets, C.R., stainless, 302 (lb)	0.548				
		Sheets, electrical	9.000				
		Strip, C.R., carbon	7.243				

‡Not available.

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Jan. 12 1954	Jan. 5 1954	Month Ago	Dec. Average
(1947-1949=100)	141.3	141.3	141.4	141.4

STEEL's FINISHED STEEL PRICE INDEX

	Jan. 14 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	189.74	189.74	189.74	181.31	151.86
Index in cents per lb	5.140	5.140	5.140	4.912	4.114

STEEL's ARITHMETICAL PRICE COMPOSITE*

	Jan. 14 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Finished Steel, NT	$113.91	$113.91	$114.64	$110.98	$97.77
No. 2 Fdry, Pig Iron, GT	56.54	56.54	56.54	55.04	46.69
Basic Pig Iron, GT	56.04	56.04	56.04	54.66	46.29
Malleable Pig Iron, GT	57.27	57.27	57.27	55.77	47.41
Steelmaking Scrap, GT	29.17	29.67	32.00	43.00	41.92

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

COMPARISON OF PRICES

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Jan. 14 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.15	4.15	4.15	3.95	3.45
Bars, H.R., Chicago	4.15	4.15	4.15	3.95	3.35
Bars, H.R., del. Philadelphia	5.302	5.302	5.302	4.502	3.79
Bars, C.F., Pittsburgh	5.20	5.20	5.20	4.925	3.95
Shapes, Std., Pittsburgh	4.10	4.10	4.10	3.85	3.275
Shapes, Std., Chicago	4.10	4.10	4.10	3.85	3.25
Shapes, deld., Philadelphia	4.38	4.38	4.38	4.13	3.48
Plates, Pittsburgh	4.10	4.10	4.10	3.90	3.50
Plates, Chicago	4.10	4.10	4.10	3.90	3.40
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.35	3.75
Plates, Sparrows Point, Md.	4.10	4.10	4.10	3.90	3.45
Plates, Claymont, Del.	4.55	4.55	4.55	4.35	3.95
Sheets, H.R., Pittsburgh	3.925	3.925	3.925	3.775	3.275
Sheets, H.R., Chicago	3.925	3.925	3.925	3.775	3.25
Sheets, C.R., Pittsburgh	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Chicago	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Detroit	4.975	4.975	4.975	4.775	4.20
Sheets, Galv., Pittsburgh	5.275	5.275	5.275	5.075	4.40
Strip, H.R., Pitts.	4.425	4.425	4.425	3.75-4.225	3.275
Strip, H.R., Chicago	3.925	3.925	3.925	3.725	3.25
Strip, C.R., Pittsburgh	5.45	5.45	5.45	5.10-5.80	4.375
Strip, C.R., Chicago	5.70	5.70	5.70	5.35	4.00
Strip, C.R., Detroit	5.45-6.05	5.45-6.05	5.45-6.05	5.30-6.05	4.20
Wire, Basic, Pitts.	5.525	5.525	5.525	5.10-5.225	4.325
Nails, Wire, Pittsburgh	6.55	6.55	6.55	6.20-6.35	5.775
Tin plate (1.50 lb), box, Pitts.	$8.95	$8.95	$8.95	$8.95	$6.70

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$75.50	$75.50	$75.50	$70.50	$61.00
Wire rods, $\frac{7}{32}$-$\frac{9}{16}$", Pitts.	4.525	4.525	4.525	4.425	3.775

PIG IRON, Gross Ton	Jan. 14 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bessemer, Pitts.	$57.00	$57.00	$57.00	$55.50	$47.00
Basic, Valley	56.00	56.00	56.00	54.50	46.00
Basic, deld. Phila.	60.75	60.75	60.75	59.25	50.30
No. 2 Fdry, Pitts.	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	55.00	46.25
No. 2 Fdry, Valley	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, deld. Phila.	61.25	61.25	61.25	59.75	50.80
No. 2 Fdry, Birm.	52.88	52.88	52.88	51.38	43.38
No. 2 Fdry (Birm.) del. Cin.	60.43	60.43	60.43	58.93	49.43
Malleable, Valley	56.50	56.50	56.50	55.00	46.50
Malleable, Chicago	56.50	56.50	56.50	55.00	46.50
Ferromanganese, Duquesne	200.00†	200.00†	200.00†	228.00*	163.00*

*78-82% Mn, per gross ton, Etna, Pa. †74-76% Mn, per net ton.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	$30.50	$30.50	$33.50	$44.00	$42.75
No. 1 Heavy Melt, E. Pa.	28.00	29.50	31.00	41.50	43.25
No. 1 Heavy Melt, Chicago	29.00	29.00	31.50	42.50	39.75
No. 1 Heavy Melt, Valley	29.50	29.50	29.50	44.00	40.75
No. 1 Heavy Melt, Cleve.	28.50	28.50	29.50	43.00	40.25
No. 1 Heavy Melt, Buffalo	27.50	27.50	29.50	43.00	47.00
Rails, Rerolling, Chicago	38.00	39.50	42.50	52.50	59.50
No. 1 Cast, Chicago	32.50	32.50	33.50	43.00	63.50

COKE, Net Ton

Beehive, Furn, Connlsvl.	$14.75	$14.75	$14.75	$14.75	$14.50
Beehive, Fdry, Connlsvl.	16.75	16.75	16.75	17.00	17.00
Oven Fdry, Chicago	24.50	24.50	24.50	24.50	20.40

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots 21.50, pigs 20.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 23.30; No. 43, 5% Si, 23.10; No. 142, 4% Cu, 24.40; No. 195, 4.5% Cu, 0.8% Si, 23.70; No. 214, 3.8% Mg, 24.40; No. 356, 7% Si, 0.3% Mg, 23.20.

Antimony: R.M.M. brand, 99.5% 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Texas, in bulk. Foreign brands, 99.5%, 25.50-26.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

DAILY NONFERROUS PRICE RECORD

	Price Jan. 14	Change	Previous Price	Dec. Avg.	Nov. Avg.	Jan. 1953 Avg.
Copper	29.50-30.00	Oct. 20	29.00-30.00	29.750	29.750	24.500
Lead	13.30	Sept. 16	13.80	13.300	13.300	13.925
Zinc	10.00	Sept. 11	10.50	10.000	10.000	12.500
Tin	85.00	Jan. 14	84.75	84.913	83.352	121.500
Nickel	60.00	Jan. 14	56.50	60.000	60.000	56.500
Aluminum	21.50	July 15	20.50	21.500	21.500	20.000
Magnesium	27.00	Mar. 9	24.50	27.000	27.000	24.500

Quotations in cents per pound based on: Copper, deld. Conn. Valley; Lead, common grade, deld. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, deld. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99+%, deld.; Magnesium 99.8%, Freeport, Tex.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $2.00 per lb deld.

Cobalt: 97-99%, $2.60 per lb for 550 lb keg, $2.62 per lb for 100 lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 29.50-30.00 deld. Conn. Valley, 29.625-30.125 deld. Midwest; Lake 30.00 deld; Fire refined 29.75 deld.

Germanium: 99.9%, $295 per lb nom.

Gold: U. S. Treasury, $35 per oz.

Iadium: 99.9%, $2.25 per troy oz.

Iridium: $165-$175 per troy oz.

Lead: Common 13.30, chemical 13.40, corroding 13.40, St. Louis, New York basis, add 0.20.

Lithium: 98%, $11-$14 per lb, depending on quantity.

Magnesium: 99.8% standard ingots 27.00, 10,000 lb or more, f.o.b. Freeport, Tex. Sticks, 1.3 in. dia., 46c, 100 to 4000 lb.

Magnesium Alloys: AZ91B 30.50; AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more.

Mercury: Open market, spot, New York, $187-$189 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3.40 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 60.00; 25-lb pigs 62.65; "XX" nickel shot 63.65; "F" nickel shot or ingots for addition to cast iron, 60.00; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $140-$150 per troy oz nom.

Palladium: $22-$24 per troy oz.

Platinum: $91-$93 per troy oz. from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $125 per troy oz.

Ruthenium: $75-$80 per troy oz.

Selenium: 99.5%, $5-$6 per lb.

Sodium: 16.50, carlots; 17.00 l.c.l.

Tantalum: Sheet, rod $39.00 per lb; powder $33.50 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, New York, 85.00.

Titanium: Sponge, 99.3+%, $5 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000 lb lots $5.35 per lb f.o.b. shipping point; less than 1000 lb $5.50; 99+% hydrogen reduced, $5.85. Treated ingots $7.95.

Zinc: Prime western 10.00, brass special 10.25, intermediate 10.50, E. St. Louis, freight allowed over 0.50 per pound. High grade 11.35, special high grade 11.50, die casting alloy ingot 14.50, deld.

Zirconium: Sponge $14.00 per lb; powder 100 lb or more $7.00; less than 100 lb $8.00. (Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston Alloys 19.75-20.75; No. 12 foundry alloy (No. 2 grade) 19.50-19.75; 5% silicon alloy, 0.60 Cu max., 22.00-22.50; 13 alloy, 0.60 Cu max., 22.00-22.50; 195 alloy 21.00-21.50; 108 alloy 20.00-20.50; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 20.75-21.25; grade 2, 19.75-20.50; grade 3, 18.75-19.25; grade 4, 17.00-17.75.

Brass Ingot: Red brass, No. 115,24.50; tin bronze No. 225, 35.25, No. 245, 29.50; high-leaded tin bronze, No. 305, 28.75; No. 1 yellow, No. 405, 20.75; manganese bronze No. 421, 25.25.

Magnesium Alloy Ingot: AZ63A, 31.50; AZ91B, 31.50; AZ91C, 32.00; AZ92A, 31.50.

NONFERROUS MILL PRODUCTS

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 35.36; 30,000 lb lots, 35.48; l.c.l. 35.98. Weatherproof, 100,000 lb, 36.28; 30,000 lb, 36.53; l.c.l., 37.03. Magnet wire deld., 15,000 lb or more 41.83; l.c.l., 42.58.

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more $18.50 per cwt; pipe, full coils $18.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 100,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forging billets, $6; hot-rolled and forged bars, $6.

ZINC

Sheets 23.00, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50, f.o.b. mill, 36,000 lb and over. Plates 19.00-22.25.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	86.5	67.5	92.5
Strip, C.R.	92.5	70.5	98.5
Plate, H.R.	84.5	66.5	90.5
Rod, Shapes	82.5	65.5	88.5
Seamless Tubes	115.5	100.5	137.5
Shot, Blocks	....	60.0	....

ALUMINUM

(30,000 lb base; freight allowed over 499 lb)

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Inc.	Flat Sheet*	Coiled Sheet	Coiled Sheet Circle†
0.249-0.136	12-48	33.9	...	...
0.135-0.096	12-48	34.4	...	...
0.095-0.077	12-48	35.1	32.7	37.5
0.076-0.061	12-48	35.7	32.9	37.7
0.060-0.048	12-48	36.1	33.2	38.1
0.047-0.038	12-48	36.6	33.6	38.4
0.037-0.030	12-48	37.0	34.0	39.1
0.029-0.024	12-48	37.6	34.3	39.6
0.023-0.019	12-36	38.3	35.1	40.4
0.018-0.017	12-36	39.1	35.7	41.3
0.016-0.015	12-36	40.0	36.5	42.5
0.014	12-24	41.0	37.5	43.8
0.013-0.012	12-24	42.1	38.2	44.8
0.011	12-24	43.1	39.4	46.4
0.010-0.0095	12-24	44.3	40.5	48.0
0.009-0.0085	12-24	45.6	41.9	50.0
0.008-0.0075	12-24	47.1	43.1	51.8
0.007	12-18	48.6	44.6	54.1
0.006	12-18	50.2	46.0	59.1

* 72-180 in. lengths. † 26 in. max. dia.

ALUMINUM

Plates and Circles: Thickness 0.250-3.0 in., 24-60 in. widths or dia., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
2S-F, 3S-F	32.4	36.3
50S-F	33.5	37.4
4S-F	34.5	39.1
52S-F	36.2	40.9
61S-T6	37.4	41.5
24S-T4*	39.3	45.4
75S-T6*	47.1	53.7

* 24-48 in. widths or dia., 72-180 in. lengths.

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or across flats	—Round— 11S-T3	17S-T4	—Hexagonal— 11S-T3	17S-T4
Drawn				
0.125	59.6	57.9	...	...
0.156-0.172	50.6	48.9	...	...
0.188	50.6	48.9	...	62.4
0.219-0.234	47.9	46.2	...	...
0.250-0.281	47.9	46.2	...	59.5
0.313	47.9	46.2	...	56.8
Cold-finished				
0.375-0.531	46.6	44.9	56.2	53.4
0.563-0.688	46.6	44.9	53.4	50.2
0.750-1.000	45.5	43.8	48.9	47.3
1.063	45.5	43.8	...	45.7
1.125-1.500	43.8	42.1	47.3	45.7
Rolled				
1.563	42.7	41.0	...	...
1.625-2.000	42.1	40.4	...	44.1
2.125-2.500	41.1	39.4	...	...
2.750-3.375	39.9	38.2	...	...

ALUMINUM

Forging Stock: Round, Class 1, 42.05-32.76, in specific lengths 36-144 in., diameters 0.375-8 in.; rectangles and squares, Class 1, 49.2 to 37.6 in random lengths 0.375-4.0 in. thick, widths 0.750-10.0 in.

Pipe: A.S.A. Schedule 40, alloy 63S-T6, 20 ft length, plain ends, 90,000 lb base, per 100 ft.

Nom. pipe size, in.		Nom. pipe size, in.	
¾	$15.05	2	$ 46.30
1	23.65	4	127.70
1¼	32.00	6	228.50
1½	38.25	8	343.80

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 108.00, 0.064-in. 81.00, 0.125-in. 71.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled, AZ31, 53.00, 20,000 lb or more 0.188-1.0 in. thick, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 69.00, 20,000 lb or more, ¼-in. thick, widths 24-48 in., lengths 60-144 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in. 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ¼-in. 67.00. Channels, 5 in. 67.80. I-Beams, 5 in. 66.20.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.38b	45.98c	....	48.44	26.000	26.000	25.250
Yellow Brass	41.72	41.66	42.26	44.63	19.750	19.500	18.000
Red Brass, 85%	45.44	45.38	45.98	48.25	23.000	22.750	22.250
Low Brass, 80%	44.47	44.41	45.01	47.28	22.125	21.875	21.375
Naval Brass	45.76	40.07	52.80	48.92	18.250	18.000	17.500
Commercial Bronze, 90%	46.95	46.89	47.49	49.51	23.875	23.625	23.125
Nickel Silver, 10%	55.36	59.43g	57.69	....	23.625	23.375	11.813
Phosphor Bronze, A, 5%	66.58	67.08	67.08	68.23	26.125	25.875	24.875
Silicon Bronze	52.71	51.90	52.75	70.11e	25.125	24.875	24.125
Manganese Bronze	49.48	43.62	54.06	....	18.250	18,000	17.500
Muntz Metal	43.96	39.77	....	....	18.625	18.375	17.875

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 2S clipping 11.00; low copper clippings 11.00; mixed clippings 9.00-10.00; old sheet 8.00-9.00; borings and turnings 5.50; pistons and struts 5.50; crankcases 8.00-9.00; industrial castings 8.00-9.00.

Copper and Brass: Heavy copper and wire, No. 1 23.00; No. 2 copper 21.00; light copper 19.00; No. 1 composition red brass 16.50-17.00; No. 1 composition turnings 16.00; mixed brass turnings 10.00; new brass clippings 16.50-17.00; No. 1 brass rod turnings 11.50-12.00; light brass 9.50-10.00; heavy yellow brass 12.00-12.50; new brass rod ends 14.00; auto radiators, unsweated, 12.00; cocks and faucets 14.00-14.50; brass pipe 15.50-16.00.

Lead: Heavy 10.50; battery plate 5.50-5.75; linotype and stereotype 12.50; electrotype 11.00; mixed babbitt 12.00-12.50.

Magnesium: Clippings 20.00-21.00; clean castings 19.00-20.00; iron castings, not over 10% removable Fe, 18.00-19.00.

Monel: Clippings 22.00-24.00; old sheet 20.00-22.00; turnings 14.00-16.00; rods 22.00-24.00.

Nickel: Sheets and clips 60.00-65.00; rolled anodes 60.00-65.00; turnings 40.00; rod ends 60.00-65.00.

Tin: No. 1 pewter 40.00-45.00; block tin pipe 65.00-67.00; No. 1 babbitt 37.00-38.00.

Zinc: Old zinc, 3.50; new die cast scrap, 3.50; old die cast scrap, 3.25.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 2S, 3S clippings 13.50-14.00; 51S, 52S clippings 13.50-14.00; 14S, 17S, 24S clippings 12.50-13.00; mixed clippings 12.25-13.00; old sheet 10.50-11.00; old cast 10.50-11.00; clean old cable, free of steel 13.50-14.00; borings and turnings 11.00-11.50.

Berrylium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 24.00-24.50; No. 2 copper 22.50; light copper 21.00; refinery brass (60% copper) per dry copper content 19.50; auto radiators, nominal.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 23.50-24.00; No. 2 copper 22.00-22.50; light copper 20.50-21.00; No. 1 composition borings 17.50-18.00; No. 1 composition solids 18.00-18.50; heavy yellow brass solids 13.75-14.25; yellow brass turnings 13.50; radiators 14.25.

PLATING MATERIALS

(F.o.b. shipping points, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $2.15 per lb.

Copper: Flat-rolled 45.04, oval 44.54, 2000-5000 lb; electrodeposited 39.78, cast 42.04, 5000-10,000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb $1.035; 200-499 lb $1.02; 500-999 lb $1.015; 1000 lb or more $1.01.

Zinc: Bar 18.50, bar or flat top 17.50, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100 lb drums.

Chromic Acid: Less than 2000 lb 29.00; over 2000 lb 28.75.

Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.90.

Copper Sulphate: 100-6000 lb 11.35; 6000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00; 200 lb 43.00; 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulphate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,000 lb 30.00; 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 78.50; 2500 oz and over 77.375.

Sodium Cyanide: Egg, under 1000 lb 19.80, 1000-19,900 lb 18.80, 20,000 lb and over 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb 67.2; 100-600 lb 53.2; 700-1900 lb 50.7; 2000-9900 lb 49; 10,000 lb or more 47.8.

Stannous Chloride (Anhydrous): Less than 50 lb $1.521; 50 lb $1.181; 100-300 lb $1.031; 400-900 lb $1.007; 100-1900 lb 98.2; 2000-4900 lb 94.6; 5000-19,000 lb 88.5; 20,000 lb and over 82.4.

Stannous Sulphate: Less than 50 lb $1.223; 50 lb 92.3; 100-1900 lb 90.3; 2000 lb and over 88.3.

Zinc Cyanide: Under 1000 lb 54.30, 1000 lb and over 52.30.

Nonferrous Metals

Growing U. S. minerals consumption makes the nation more dependent on foreign sources of supply than ever. Distinguishing necessary imports from dumping is difficult

INDUSTRY today is more dependent on foreign sources of supply for metals and metallic raw materials than ever before.

This trend is supported by data contained in the Bureau of Mines summary of 1953 mineral production, issued last week. It adds weight to the conclusion reached by government advisory groups (such as the President's Materials Policy Commission) and independent studies (STEEL, Oct. 8, 1951, p. 120) that no nation is self-sufficient in metals.

Highest in History—Mineral production in the U. S. last year is estimated by the Bureau at 7 per cent over 1952, with total valuation of $14,346 million. Metals output in 1953 was valued at $1,777 million, $175 million above 1952.

While some domestic metals suffered at the hands of foreign competitors, over-all need for supplies from abroad is greater than ever before. This dependence does not encompass merely the strategic metals but extends to a sizable proportion of those in commercial demand by industry. As the numerous study groups in Washington are learning, the line between necessary imports and dumping is not easy to draw. Here's how a half-dozen major nonferrous metals look from an import standpoint:

Aluminum—Over 17 per cent of our total primary supply is produced abroad, nearly all in Canada. U. S. production last year hit 1.25 million tons; imports reached 270,000 tons.

Copper—For the past decade, about 40 per cent of our domestic needs were imported, principally from South America and Africa. Last year domestic mines turned out 926,000 tons, while gross imports hit an estimated 625,000 tons.

Lead—Foreign sources account for 41 per cent of our needs. Last year 545,000 tons came in, about the same level as 1952. Domestic mines turned out 340,000 tons, down 50,000 tons from 1952. Secondary output was 450,000 tons, off 21,000 tons from the year before. Canada, Mexico, Australia and Yugoslavia are suppliers.

Nickel—Some 85 per cent of the free world's supply comes from Canada, though Cuba is heading toward a bright future with the metal. The U. S. produces only 700 tons a year.

Tin—For all practical purposes the U. S. produces no tin ore, yet it uses about half the world's supply, which comes from Malaya, Indonesia, Bolivia, Belgian Congo.

Zinc—Swamping the market, importers last year brought in 525,000 tons of ores and concentrates, up 96,000 tons from 1952, and 230,000 tons of slab, up 100 per cent, causing U. S. mine production to sink to 540,000 tons, lowest level since 1938. This came about despite an all-time consumption peak of about 1 million tons. However, even here the domestic industry can't take care of all industrial needs.

Shades in Copper

Price shading in copper and copper alloy mill and foundry products is getting to be the rule rather than the exception. Brass mills are now on a four-day week and even so are having trouble disposing of production. Competition in wire mill products is also fierce, with buyers playing close to the vest until the price is right. Published prices for copper and brass ingot are considered a mere starting point for negotiation by most firms, and a trimming of the official price in the near future is a distinct possibility.

More Nickel for Civilian Use

Civilian nickel users will get a better supply break in February than in January when their supply was crimped an average of 25 per cent. ODM is alloting at least 250 tons of Nicaro's output for February delivery to civilian users, though the Government pinched about three times that amount from them in January.

In a move to squeeze out more nickel, General Services Administration will expand the Government-owned, industry-operated Nicaro, Cuba, plant by 75 per cent from its current operating rate of 14,000 tons yearly.

GSA is setting up a $1-million research fund to explore the confusing array of current refining processes in the search for an economical technique.

New Nickel Processing Plans

Though it has mined and smelted nickel ores in Canada since 1930, Falconbridge Nickel Mines, Ltd., world's second-largest nickel producer, has always refined its metallic nickel in Norway. Promising development work on treatment of nickel-copper sulphide concentrates without using pressure vessels led the company to acquire a site on the Welland Canal in Port Colborne, Ont., for erection of a smelter. Actual construction hinges on perfection of the company's hydrometallurgical process to recover separately nickel, copper, cobalt and precious metals.

Bethlehem Steel Co. is also reportedly ready to join the circle of nickel producers. It's negotiating with the Government to set up a small chemical refinery at Bethlehem, Pa., to handle 159 tons of ore per day, separating iron, nickel, chrome and aluminum.

Zinc Stockpile Climbs Higher

Back at the beginning of 1951 when zinc markets were riding the defense boom, producers had total stocks of less than 10,000 tons. Going into 1954 they not only have 180,620 tons piled up, but they seemingly don't know what to do about the continuing additions. The increase of 15,000 tons in December brought stocks to their highest point in over six years.

Aluminum Sales Skid

Aluminum salesmen complaining about poor sales in October-November are sustained by November shipment statistics issued by the Aluminum Association. Sheet and plate shipments nose-dived 22 per cent, with nonheat-treatable types leading the way. Rod, tube and extrusions were also off significantly. In fact, the only increase recorded was in electric wire and cable.

Primary output slipped seasonally to 195,637 tons from October's 108,219 tons.

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for urgent military and

civilian requirements

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STEEL PRICES

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on page 113. Key to footnotes, page 115.

—SEMIFINISHED—

INGOTS, Carbon Forging (NT)
Fontana,Calif. K1 ....$86.00
Munhall,Pa. U5 .....59.00

INGOTS, Alloy (NT)
Detroit R7 .....$63.00
Fontana,Calif. K1 ....88.00
Midland,Pa. C18 .....62.00
Munhall,Pa. U5 .....62.00

BILLETS, BLOOMS & SLABS Carbon Rerolling (NT)
Aliquippa,Pa. J5 ....$62.00
Bessemer,Pa. U5 .....62.00
Clairton,Pa. U5 .....62.00
Ensley,Ala. T2 .....62.00
Fairfield,Ala. T2 .....62.00
Fontana,Calif. K1 ....70.00
Gary,Ind. U5 .....62.00
Johnstown,Pa. B2 ....62.00
Lackawanna,N.Y. B2..62.00
Munhall,Pa. U5 .....62.00
So.Chicago,Ill. U5 ....62.00
So.Duquesne,Pa. U5 ..62.00

Carbon, Forging (NT)
Aliquippa,Pa. J5 ....$75.50
Bessemer,Pa. U5 .....75.50
Buffalo R2 .....75.50
Canton,O. R2 .....75.50
Clairton,Pa. U5 .....75.50
Cleveland R2 .....75.50
Conshohocken,Pa. A3..82.50
Detroit R7 .....78.50
Ensley,Ala. T2 .....75.50
Fairfield,Ala. T2 ....75.50
Fontana,Calif. K1 ....83.50
Gary,Ind. U5 .....75.50
Geneva,Utah C11 ....75.50
Houston S5 .....83.50
Johnstown,Pa. B2 ....75.50
Lackawanna,N.Y. B2 ..75.50
LosAngeles B3 .....94.50
Munhall,Pa. U5 .....75.50
Seattle B3 .....94.50
So.Chicago R2, U5, W14 75.50
So.Duquesne,Pa. U5 ..75.50
So.SanFrancisco B3 ..94.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$82.00
Buffalo R2 .....82.00
Canton,O. R2, T7 ....82.00
Conshohocken,Pa. A3 ..89.00
Detroit R7 .....84.00
Fontana,Calif. K1 ....101.00
Gary,Ind. U5 .....82.00
Houston S5 .....90.00
Ind.Harbor,Ind. Y1 ...82.00
Johnstown,Pa. B2 ....82.00
Lackawanna,N.Y. B2 ..82.00
LosAngeles B3 .....102.00
Massillon,O. R2 .....82.00
Midland,Pa. C18 .....82.00
Munhall,Pa. U5 .....82.00
So.Chicago R2, U5, W14 82.00
So.Duquesne,Pa. U5 ...82.00
Struthers,O. Y1 .....82.00
Warren,O. C17 .....82.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$92.50
Canton,O. R2 .....92.50
Cleveland R2 .....92.50
Fontana,Calif. K1 ...113.50
Gary,Ind. U5 .....92.50
Massillon,O. R2 .....92.50
So.Chicago,Ill. R2 ....92.50
So.Duquesne,Pa. U5 ...92.50

SHEET BAR (NT)
Fontana,Calif. K1 ....$93.18

SKELP
Aliquippa,Pa. J5 .....3.85
Munhall,Pa. U5 .....3.75
Warren,O. R2 .....3.75
Youngstown R2, U5 ...3.75

WIRE RODS
AlabamaCity,Ala. R2..4.525
Aliquippa,Pa. J5 .....4.525
Alton,Ill. L1 .....4.70
Buffalo W12 .....4.525
Cleveland A7 .....4.525
Donora,Pa. A7 .....4.525
Fairfield,Ala. T2 .....4.525
Fontana,Calif. K1 ....5.325
Houston S5 .....4.925
Johnstown,Pa. B2 ....4.525
Joliet,Ill. A7 .....4.525
KansasCity,Mo. S5 ....4.865
LosAngeles B3 .....5.325
Minnequa,Colo. C10 ..4.775
Monessen,Pa. P7 .....4.725
No.Tonawanda,N.Y.B11 4.525
Pittsburg,Calif. C11 ...5.175
Portsmouth P12 .....4.525
Roebling,N.J. R5 .....4.625
So.Chicago,Ill. R2 ....4.525
SparrowsPoint,Md. B2..4.625
Sterling,Ill.(1) N15 ...4.525
Struthers,O. Y1 .....4.525
Torrance,Calif. C11 ...5.325
Worcester,Mass. A7 ...4.825

—STRUCTURALS—

Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..4.10
Aliquippa,Pa. J5 .....4.10
Bessemer,Ala. T2 .....4.10
Bethlehem,Pa. B2 .....4.15
Clairton,Pa. U5 .....4.10
Fairfield,Ala. T2 .....4.10
Fontana,Calif. K1 ....4.75
Gary,Ind. U5 .....4.10
Geneva,Utah C11 .....4.10
Houston S5 .....4.50
Ind.Harbor,Ind. I-2 ....4.10
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 ....4.70
Lackawanna,N.Y. B2 ..4.15
LosAngeles B3 .....4.80
Minnequa,Colo. C10 ....4.55
Munhall,Pa. U5 .....4.10
Niles,Calif. P1 .....4.80
Phoenixville,Pa. P4 ....4.15
Seattle B3 .....4.85
So.Chicago,Ill. U5, W14 4.10
So.SanFrancisco B3 ....4.75
Torrance,Calif. C11 ....4.80
Weirton,W.Va. W6 ....4.35

Wide Flange
Bethlehem,Pa. B2 .....4.15
Clairton,Pa. U5 .....4.10
Fontana,Calif. K1 ....5.30
Lackawanna,N.Y. B2 ..4.15
Munhall,Pa. U5 .....4.10
Phoenixville,Pa. P4 ....4.95
So.Chicago,Ill. U5 ....4.10

Alloy Stand. Shapes
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 ....6.40
Gary,Ind. U5 .....5.00
Munhall,Pa. U5 .....5.00
So.Chicago,Ill. U5 ....5.00

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....6.175
Bessemer,Ala. T2 .....6.175
Bethlehem,Pa. B2 .....6.20
Clairton,Pa. U5 .....6.175
Fairfield,Ala. T2 .....6.175
Fontana,Calif. K1 ....6.825
Gary,Ind. U5 .....6.175
Geneva,Utah C11 .....6.175
Ind.Harbor,Ind. I-2 ...6.175
Ind.Harbor,Ind. Y1 ..6.675
Johnstown,Pa. B2 .....6.20
Lackawanna,N.Y. B2 ..6.20
LosAngeles B3 .....6.85
Munhall,Pa. U5 .....6.175
Seattle B3 .....6.90
So.Chicago,Ill. U5, W14 6.175
So.SanFrancisco B3 ....6.80
Struthers,O. Y1 .....6.675

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....6.20
Lackawanna,N.Y. B2 ..6.20
Munhall,Pa. U5 .....6.125
So.Chicago,Ill. U5 ....6.125

BEARING PILES
Munhall,Pa. U5 .....4.10
So.Chicago,Ill. U5 ....4.10

—PILING—

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ...4.925
Lackawanna,N.Y. B2 ..4.925
Munhall,Pa. U5 .....4.925
So.Chicago,Ill. U5 ....4.925

—PLATES—

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..4.10
Aliquippa,Pa. J5 .....4.10
Ashland,Ky. (15) A10..4.10
Bessemer,Ala. T2 .....4.10
Clairton,Pa. U5 .....4.10
Claymont,Del. C22 .....4.20
Cleveland J5, R2 .....4.10
Coatesville,Pa. L7 ....4.20
Conshohocken,Pa. A3 ..4.25
Ecorse,Mich. G5 .....4.30
Fairfield,Ala. T2 .....4.10
Fontana,Calif.(30) K1 ..4.75
Gary,Ind. U5 .....4.10
Geneva,Utah C11 .....4.10
GraniteCity,Ill. G4 ....4.30
Harrisburg,Pa. C5 ....4.10
Houston S5 .....4.50
Ind.Harbor,Ind. I-2, Y1.4.10
Johnstown,Pa. B2 .....4.10
Lackawanna,N.Y. B2 ..4.10
Minnequa,Colo. C10 ....4.95
Munhall,Pa. U5 .....4.10
Pittsburgh J5 .....4.10
Riverdale,Ill. A1 .....4.10
Seattle B3 .....5.00
Sharon,Pa. S3 .....4.10
So.Chicago,Ill. U5, W14.4.10
SparrowsPoint,Md. B2 ..4.10
Steubenville,O. W10 ....4.10
Warren,O. R2 .....4.10
Weirton,W.Va. W6 ....4.10
Youngstown R2, U5, Y1.4.10

PLATES, Carbon Abras. Resist.
Fontana,Calif. K1 ....5.90
Geneva,Utah C11 .....5.25

PLATES, Wrought Iron
Economy,Pa. B14 .....9.30

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.25
Bessemer,Ala. T2 .....6.25
Clairton,Pa. U5 .....6.25
Cleveland J5 .....6.25
Conshohocken,Pa. A3 ..6.25
Ecorse,Mich. G5 .....6.45
Fairfield,Ala. T2 .....6.25
Fontana,Calif. (30) K1..6.95
Gary,Ind. U5 .....6.25
Geneva,Utah C11 .....6.25
Ind.Harbor,Ind. I-2 ....6.25
Ind.Harbor,Ind. Y1 ....6.75
Johnstown,Pa. B2 .....6.25
Lackawanna,N.Y. B2 ..6.25
Munhall,Pa. U5 .....6.25
Pittsburgh J5 .....6.25
Seattle B3 .....7.15
Sharon,Pa. S3 .....6.25
So.Chicago,Ill. U5, W14.6.25
SparrowsPoint,Md. B2 ..6.25
Youngstown U5 .....6.25
Youngstown Y1 .....6.75

PLATES, Alloy
Claymont,Del. C22 .....5.55
Coatesville,Pa. L7 .....5.55
Fontana,Calif. K1 ....6.60
Gary,Ind. U5 .....5.55
Johnstown,Pa. B2 .....5.55
Munhall,Pa. U5 .....5.55
Sharon,Pa. S3 .....5.55
So.Chicago,Ill. U5, W14.5.55
SparrowsPoint,Md. B2 ..5.55

FLOOR PLATES
Cleveland J5 .....5.15
Conshohocken,Pa. A3 ..5.15
Harrisburg,Pa. C5 ....5.15
Ind.Harbor,Ind. I-2 ....5.15
Munhall,Pa. U5 .....5.15
So.Chicago,Ill. U5 ....5.15

PLATES, Ingot Iron
Ashland c.l. (15) A10 ..4.35
Ashland,l.c.l.(15) A10 ..4.85
Cleveland, c.l. R2 .....4.70
Warren,O. c.l. R2 .....4.70

—BARS—

BARS, Hot-Rolled Carbon
Aliquippa,Pa. J5 .....4.15
Alton,Ill. L1 .....4.35
Atlanta,Ga. A11 .....4.40
Bessemer,Ala. T2 .....4.15
Buffalo(31) R2 .....4.18
Clairton,Pa. U5 .....4.15
Cleveland(31) R2 .....4.21
Detroit R7 .....4.30
Ecorse,Mich. G5 .....4.35
Emeryville,Calif. J7 ....4.90
Fairfield,Ala. T2 .....4.15
Fairless,Pa. U5 .....4.30
Fontana,Calif. K1 ....4.85
Gary,Ind. U5 .....4.15
Gadsden,Ala.(31) R2 ....4.18
Houston S5 .....4.55
Ind.Harbor,Ind. I-2, Y1.4.15
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 .....4.75
Lackawanna,N.Y. B2 ..4.15
LosAngeles B3 .....4.85
Milton,Pa. M18 .....4.15
Minnequa,Colo. C10 ....4.60
Niles,Calif. P1 .....4.85
N.Tonawanda,N.Y. B11 .4.15
Pittsburg,Calif. C11 ...4.85
Pittsburgh J5 .....4.15
Portland,Oreg. O4 .....4.90
Seattle B3, N14 .....4.90
So.Chicago U5, W14 ....4.15
Chicago(31) R2 .....4.22
So.Duquesne,Pa. U5 ....4.15
So.SanFran.,Calif. B3 ..4.90
Sterling,Ill.(1) N15 ....4.15
Struthers,O. Y1 .....4.15
Torrance,Calif. C11 ....4.85
Weirton,W.Va. W6 ....4.15
Youngstown U5 .....4.15
Youngstown(31) R2 ....4.20

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 .....4.875
Buffalo R2 .....4.875
Canton,O. R2, T7 ....4.875
Clairton,Pa. U5 .....4.875
Detroit R7 .....4.975
Ecorse,Mich. G5 .....5.075
Fairless,Pa. U5 .....5.025
Fontana,Calif. K1 ....5.925
Gary,Ind. U5 .....4.875
Houston S5 .....5.275
Ind.Harbor,Ind. I-2, Y1 4.875
Johnstown,Pa. B2 ....4.875
KansasCity,Mo. S5 ..5.475
Lackawanna,N.Y. B2..4.875
LosAngeles B3 .....5.925
Massillon,O. R2 .....4.875
Midland,Pa. C18 .....4.875
So.Chicago R2, U5,W14 4.875
So.Duquesne,Pa. U5 ..4.875
Struthers,O. Y1 .....4.875
Warren,O. C17 .....4.875
Youngstown U5 .....4.875

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.225
Bessemer,Ala. T2 .....6.225
Bethlehem,Pa. B2 .....6.225
Clairton,Pa. U5 .....6.225
Ecorse,Mich. G5 .....6.425
Fairfield,Ala. T2 .....6.225
Fontana,Calif. K1 ....7.475
Gary,Ind. U5 .....6.225
Ind.Harb.,Ind. Y1 ....6.725
Ind.Harb.,Ind. I-2 ....6.225
Johnstown,Pa. B2 .....6.225
Lackawanna,N.Y. B2 ..6.225
LosAngeles B3 .....6.925
Pittsburgh J5 .....6.225
Seattle B3 .....6.975
So.Chicago W14 .....6.225
So.Duquesne,Pa. U5 ..6.225
So.SanFrancisco B3 ..6.975
Struthers,O. Y1 .....6.725
Youngstown U5 .....6.225

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 .....4.35

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....4.15
Atlanta A11 .....4.40
Niles,Calif. P1 .....4.85
SanFrancisco S7 .....5.10

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 .....6.00
Gary,Ind. U5 .....5.00
Houston S5 .....5.60
KansasCity S5 .....5.60
Youngstown U5 .....5.00

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....5.20
BeaverFalls,Pa. M12, R2 5.20
Buffalo B5 .....5.25
Camden,N.J. P13 .....5.65
Carnegie,Pa. C12 .....5.20
Chicago W18 .....5.20
Cleveland A7, C20 ....5.20
Detroit P17, R7 .....5.35
Detroit B5 .....5.40
Donora,Pa. A7 .....5.20
Elyria,O. W8 .....5.20
FranklinPark,Ill. N5 ..5.20
Gary,Ind. R2 .....5.20
GreenBay,Wis. F7 .....5.20
Hammond,Ind. L2, M13 5.20
Hartford,Conn. R2 .....5.75
Harvey,Ill. B5 .....5.20
LosAngeles R2 .....6.65
Mansfield,Mass. B5 ....5.75
Massillon,O. R2, R8 ..5.20
Monaca,Pa. S17 .....5.20
Newark,N.J. W18 .....5.65
NewCastle,Pa. (17) B4..5.20
Pittsburgh J5 .....5.20
Plymouth,Mich. P5 .....5.45
Putnam,Conn. W18 .....5.75
Readville,Mass. C14 ....5.75
St.Louis,Mo. M5 .....5.50
So.Chicago,Ill. W14 ....5.20
SpringCity,Pa. K3 .....5.65
Struthers,O. Y1 .....5.20
Waukegan,Ill. A7 .....5.20
Worcester,Mass. W19 ..6.10
Youngstown F3, Y1 ....5.20

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md. (5) C19 4.45

BARS, Cold-Finishing Alloy
Ambridge,Pa. W18 ....6.325
BeaverFalls,Pa. M12 ..6.325
Bethlehem,Pa. B2 .....6.325
Buffalo B5 .....6.325
Camden,N.J. P13 .....6.50
Canton,O. R2, T7 ....6.325
Carnegie,Pa. C12 .....6.325
Chicago W18 .....6.325
Cleveland A7, C20 ....6.325
Detroit R7 .....6.425
Detroit P17 .....6.475
Detroit B5 .....6.525
Donora,Pa. A7 .....6.325
Elyria,O. W8 .....6.325
Gary,Ind. R2 .....6.325
Hammond,Ind. L2, M13 6.325
Hartford,Conn. R2 ....6.775
Harvey,Ill. B5 .....6.325
Lackawanna,N.Y. B2 ..6.325
Mansfield,Mass. B5 ..6.775
Massillon,O. R2, R8 ..6.325
Midland,Pa. C18 .....6.325
Monaca,Pa. S17 .....6.325
Newark,N.J. W18 .....6.65
Plymouth,Mich. P5 ....6.525
So.Chicago,Ill. R2, W14 6.325
SpringCity,Pa. K3 .....6.50
Struthers,O. Y1 .....6.325
Warren,O. C17 .....6.325
Waukegan,Ill. A7 .....6.325
Worcester,Mass. A7 ..6.625
Youngstown F3, Y1 ..6.325

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..4.15
Atlanta A11 .....4.40
Buffalo R2 .....4.15
Cleveland R2 .....4.15
Emeryville,Calif. J7 ....4.90
Fairfield,Ala. T2 .....4.15
Fairless,Pa. U5 .....4.30
Fontana,Calif. K1 ....4.85
Gary,Ind. U5 .....4.15
Houston S5 .....4.55
Ind.Harbor,Ind. I-2, Y1 4.15
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 ....4.75
Lackawanna,N.Y. B2 ..4.15
LosAngeles B3 .....4.85
Milton,Pa. M18 .....4.15
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....4.85
Pittsburg,Calif. C11 ....4.85
Pittsburgh J5 .....4.15
SandSprings,Okla. S5 ..5.00
Seattle B3, N14 .....4.90
So.Chicago,Ill. R2 .....4.15
So.Duquesne,Pa. U5 ....4.15
So.SanFrancisco B3 ....4.90
SparrowsPoint,Md. B2 ..4.15
Sterling,Ill. (1) N15 ...4.15
Struthers,O. Y1 .....4.15
Torrance,Calif. C11 ....4.85
Youngstown R2, U5 ....4.15

BARS, Reinforcing (Fabricated; to consumers)
Johnstown, ¼-1" B2 ..5.55
KansasCity S5 .....6.35
LosAngeles B3 .....5.80
Marion,O. P11 .....5.55
Seattle N14 .....5.80
Seattle B3 .....5.85
So.SanFrancisco B3 ....5.85
SparrowsPt. ¼-1" B2..5.55
Williamsport,Pa. S19 ..5.45

RAIL STEEL BARS
Avis,Pa.(4) J8 .....4.25
ChicagoHts.(3,4) C2 ....4.15
ChicagoHts.(3,4) I-2 ..4.15
FortWorth Tex.(26) T4 .4.65
Franklin,Pa.(3,4) F5 ..4.15
Marion,O.(3) P11 .....4.25
Moline,Ill.(3) R2 .....4.25
Tonawanda(3,4) B12 ..5.00
Williamsport,Pa.(3) S19 4.50
Williamsport,Pa.(4) S19 5.45

BARS, Wrought Iron
Economy,Pa.(S.R.) B14 10.40
Economy,Pa.(D.R.)B14 12.90
Economy(Staybolt) B14 13.20
Mc.K.Rks.(S.R.) L5 ..10.40
Mc.K.Rks.(D.R.) L5 ..14.00
McK.Rks.(Staybolt) L5 15.50

—SHEETS—

SHEETS, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity,Ala. R2 ..3.925
Allenport,Pa. P7 .....3.925
Ashland,Ky.(8) A10 ..3.925
Butler,Pa. A10 .....3.925
Cleveland J5, R2 .....3.925
Conshohocken,Pa. A3 ..4.05
Detroit M1 .....4.15
Ecorse,Mich. G5 .....4.125
Fairfield,Ala. T2 .....3.925
Fairless,Pa. U5 .....4.025
Fontana,Calif. K1 ....4.70
Gary,Ind. U5 .....3.925
Geneva,Utah C11 .....4.025
GraniteCity,Ill. G4 ....4.125
Ind.Harbor,Ind. I-2, Y1 3.925
Irvin,Pa. U5 .....3.925
Kokomo,Ind. C16 .....4.025
Lackawanna,N.Y. B2 ..3.925

Munhall,Pa. U5 .....3.925
Newport,Ky N9 .....3.925
Niles,O. N12 .....5.175
Pittsburg,Calif. C11 ..4.625
Pittsburgh J5 .....3.925
Portsmouth,O. P12 ....3.925
Riverdale,Ill. A1 .....3.925
Sharon,Pa. S3 .....3.925
So.Chicago,Ill. W14 ..3.925
SparrowsPoint,Md. B2..3.925
Steubenville,O. W10 ..3.925
Torrance,Calif. C11 ...4.625
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ...3.925
Youngstown U5, Y1 ..3.925

SHEETS, H.R. (19 gage)
AlabamaCity, Ala. R2..5.225
Dover,O. R1 .....5.05
Kokomo,Ind. C16 .....5.025
Mansfield,O. E6 .....5.05
Niles,O. N12 .....4.775
Torrance,Calif. C11 ...5.875

SHEETS, H.R. (14 ga. heavier)
High-Strength Low-Alloy
Cleveland J5, R2 .....5.90
Conshohocken,Pa. A3 ..5.90
Ecorse,Mich. G5 .....6.10
Fairfield,Ala. T2 .....5.90
Fontana,Calif. K1 ....6.675
Gary,Ind. U5 .....5.90
Ind.Harbor,Ind. I-2 ....5.90
Ind.Harbor,Ind. Y1 ....6.40
Irvin,Pa. U5 .....5.90
Lackawanna(35) B2 ...5.90
Munhall,Pa. U5 .....5.90
Pittsburgh J5 .....5.90
Sharon,Pa. S3 .....5.90
So. Chicago,Ill. U5 ....5.90
SparrowsPoint(36) B2..5.90
Warren,O. R2 .....5.90
Weirton,W.Va. W6 .....5.90
Youngstown U5 .....5.90
Youngstown Y1 .....6.40

SHEETS, Hot-Rolled Ingot Iron
(18 Gage and Heavier)
Ashland,Ky.(8) A10 ..4.175
Cleveland R2 .....4.525
Ind.Harbor,Ind. I-2 ...4.175
Warren,O. R2 .....4.525

SHEETS, Cold-Rolled Steel
(Commercial Quality)
Allenport,Pa. P7 .....4.775
Cleveland J5, R2 .....4.775
Ecorse,Mich. G5 .....4.975
Fairfield,Ala T2 .....4.775
Fairless,Pa. U5 .....4.875
Follansbee,W.Va. F4 ..4.775
Fontana,Calif. K1 ....5.875
Gary,Ind. U5 .....4.775
GraniteCity,Ill. G4 ...4.975
Ind.Harbor,Ind. I-2,Y1 4.775
Irvin,Pa. U5 .....4.775
Lackawanna,N.Y. B2 ..4.775
Middletown,O. A10 ....4.775
Pittsburg,Calif. C11 ..5.725
Pittsburgh J5 .....4.775
Portsmouth,O. P12 ....4.775
SparrowsPoint,Md. B2.4.775
Steubenville,O. W10 ...4.775
Warren,O. R2 .....4.775
Weirton,W.Va. W6 ...4.775
Youngstown Y1 .....4.775

SHEETS, Cold-Rolled
High-Strength Low Alloy
Cleveland J5, R2 .....7.225
Ecorse,Mich. G5 .....7.425
Fontana,Calif. K1 ....8.275
Gary,Ind. U5 .....7.225
IndianaHarbor,Ind. Y1.7.725
Irvin,Pa. U5 .....7.225
Lackawanna(37) B2 ..7.225
Pittsburgh J5 .....7.225
SparrowsPoint (38) B2 7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225
Youngstown Y1 .....7.725

SHEETS, Cold-Rolled Ingot Iron
Cleveland R2 .....5.375
Middletown,O. A10 ....5.275
Warren,O. R2 .....5.375

SHEETS, Gal'd No. 10 Steel
AlabamaCity,Ala. R2..5.275
Ashland,Ky. (8) A10 ..5.275
Canton,O. R2 .....5.275
Delphos,O. N16 .....5.775
Dover,O. R1 .....5.275
Fairfield,Ala. T2 ....5.275†
Gary,Ind. U5 .....5.275†
GraniteCity,Ill. G4 ....5.475
Ind.Harbor,Ind. I-2 ...5.325
Irvin,Pa. U5 .....5.275†
Kokomo,Ind. C16 ....5.375†
MartinsFerry,O. W10..5.275
Niles,O. N12 .....5.275
Pittsburg,Calif. C11 ..6.025†
SparrowsPoint, Md. B2.5.275
Steubenville,O. W10 ..5.275
Torrance,Calif. C11 ..6.275†
Weirton,W.Va. W6 ....5.275

†Based on 5c zinc.

SHEETS, Galvanized No. 10
High-Strength Low-Alloy
Irvin,Pa. U5 .....7.925
SparrowsPoint(39) B2 .8.075

SHEETS, Galvanized Ingot Iron
No. 10 flat
Ashland,Ky.(8) A10 ..5.525
Canton,O. R2 .....6.025

SHEETS, Culvert	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.325	....
Canton,O. R2	....6.475	6.925
Fairfield T2	....6.075	6.325
Gary,Ind. U5	...6.075	6.325
Ind.Harbor I-2	..6.075	6.325
Irvin,Pa. U5	....6.075	6.325
Kokomo,Ind. C16	6.175	....
MartinsFry.,O.W10	6.075	...
Pitts.,Cal. C11	..6.825	....
SparrowsPt. B2	.6.075	....
Torrance,Cal. C11	7.075	....

SHEETS, Culvert	Pure Iron
Ashland,Ky A10	.....6.575
Fairfield, Ala. T2	.....6.325
MartinsFerry,O. W10	..6.325

SHEETS, Galvannealed Steel
Canton,O. R2 .....5.825
Irvin,Pa. U5 .....5.825†
Kokomo,Ind. C16 ....5.925†
Niles,O. N12 .....5.825

†Based on 5c zinc

SHEETS, ZINCGRIP Steel
Butler,Pa. A10 .....5.525
Middletown,O. A10 ....5.525

SHEETS, ZINCGRIP Ingot Iron
Butler,Pa. A10 .....5.775
Middletown,O. A10 ....5.775

SHEETS, Electrogalvanized
Cleveland R2 (28) 6.125
Niles,O. R2 (28) 6.125
Weirton,W.Va. W6 ....5.975

SHEETS, ALUMINIZED
Butler,Pa. A10 .....8.625

SHEETS, Enameling Iron
Ashland,Ky.(8) A10 ..5.175
Cleveland R2 .....5.175
Gary,Ind. U5 .....5.175
GraniteCity,Ill. G4 ...5.875
Ind. Harbor,Ind. I-2 ...5.175
Irvin,Pa. U5 .....5.175
Middletown,O. A10 ....5.175
Niles,O. N12 .....6.525
Youngstown Y1 .....5.175

BLUED STOCK, 29 ga.
Follansbee,W.Va. F4 ..7.30
Follansbee (23) F4 ...7.175
Yorkville,O. W10 .....7.20

SHEETS, Long Terne Steel
(Commercial Quality)
BeechBott'm,W.Va.W10 5.675
Gary,Ind.. U5 .....5.675
Mansfield,O. E6 .....5.675
Middletown,O. A10 ....5.675
Niles,O. N12 .....5.675
Weirton,W.Va. W6 ...5.675

SHEETS, Long Terne, Ingot Iron
Middletown,O. A10 ....6.075

SHEETS, Well Casing
Fontana,Calif. K1 ....6.20

—STRIP—

STRIP, Hot-Rolled Carbon
Ala.City,Ala.(27) R2 .3.925
Allenport,Pa. P7 .....3.925
Alton,Ill. L1 .....4.10
Ashland,Ky.(8) A10 ..3.925
Atlanta A11 .....4.175
Bessemer,Ala. T2 ....3.925
Bridgeport,Conn.(10)S15 4.15
Buffalo (27) R2 .....3.925
Carnegie,Pa. S18 .....4.425
Conshohocken,Pa. A3 ..4.05
Detroit M1 .....4.15
Ecorse,Mich. G5 .....4.125
Fairfield,Ala. T2 .....3.925
Fontana,Calif. K1 .....4.70
Gary,Ind. U5 .....3.925
Houston,Tex. S5 .....4.325
Ind.Harbor,Ind. I-2,Y1 3.925
Johnstown,Pa.(25) B2 .3.925
KansasCity,Mo.(9) S5..4.525
Lackw'na,N.Y.(25) B2.3.925
LosAngeles(25) B3 ....4.675
Milton,Pa. M18 .....3.925
Minnequa,Colo. C10 ..5.025
NewBritain(10) S15 ....4.15
N.Tonawanda,N.Y.B11 3.925
Pittsburg,Calif. C11 ...4.675
Portsmouth,O. P12 ...3.925
Riverdale,Ill. A1 .....3.925
SanFrancisco S7 .....5.10
Seattle(25) B3 .....4.925
Seattle N14 .....4.925
Sharon,Pa. S3 .....3.925
So.Chicago,Ill. W14 ...3.925
So.SanFrancisco(25)B3 4.675
SparrowsPoint,Md. B2.3.925
Torrance,Calif. C11 ...4.675
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ....3.925
Youngstown U5 .....3.925

STRIP, Hot-Rolled Alloy
Bridgeport,Conn.(10)S15 6.45
Carnegie,Pa. S18 .....6.40
Fontana,Calif. K1 .....7.80
Gary,Ind. U5 .....6.40
Houston,Tex. S5 .....6.80
KansasCity, Mo. S5 ....7.00
LosAngeles B3 .....7.60
NewBritn.,Conn.(10)S15 6.45
Sharon,Pa. S3 .....6.40
So.Chicago W14 .....6.40
Youngstown U5 .....6.40

STRIP, Hot-Rolled
High-Strength Low-Alloy
Bessemer,Ala. T2 .....5.95
Conshohocken,Pa. A3 ..5.90
Ecorse,Mich. G5 .....6.15
Fairfield,Ala. T2 .....5.95
Fontana,Calif. K1 .....7.05
Gary,Ind. U5 .....5.95
Ind.Harbor,Ind. I-2 ....5.95
Ind.Harbor,Ind. Y1 ....6.45
Lackawanna,N.Y. B2 ..6.00
LosAngeles(25) B3 ....6.70
Seattle(25) B3 .....6.95
Sharon,Pa. S3 .....5.95
So.SanFrancisco(25) B3.6.70
SparrowsPoint,Md. B2 ..6.00
Warren,O. R2 .....5.95
Weirton,W.Va. W6 ....5.95
Youngstown Y1 .....6.45
Youngstown U5 .....5.95

STRIP, Hot-Rolled Ingot Iron
Ashland,Ky.(8) A10 ..4.175
Warren,O. R2 .....4.525

STRIP, Cold-Rolled Carbon
Anderson,Ind. G6 .....5.45
Bridgeprt,Conn. (10)S15..5.75
Cleveland A7, J5 .....5.45
Dearborn,Mich. D3 ....5.65
Detroit D2, M1, P20....5.65
Dover,O. G6 .....5.45
Ecorse,Mich. G5 .....5.65
Follansbee,W.Va. F4 ...5.45
Fontana,Calif. K1 .....7.35
FranklinPark,Ill. T6 ...5.70
Ind.Harbor,Ind. I-2 ....5.70
Lackawanna,N.Y. B2 ..5.45
LosAngeles C1 .....7.50
Mattapan,Mass. T6 ....6.30
Middletown,O. A10 ....5.45
NewBedford,Mass. R10 .6.00
NewBritain(10) S15 ....5.75
NewCastle,Pa. B4, E5..5.45
NewHaven,Conn. A7 ....6.20
NewHaven,Conn. D2 ...5.90
Pawtucket,R.I. N8, R3.6.30
Pittsburgh J5 .....5.45
Riverdale,Ill. A1 .....5.70
Rome,N.Y.(29) R6 ....5.45
Sharon,Pa. S3 .....6.45
SparrowsPoint,Md. B2 ..5.45
Trenton,N.J. R5 .....7.00
Wall'ford,Conn. W2 ...6.20
Warren,O.(40) T5 .....5.45
Warren,O. B9, R2 .....5.45
Weirton,W.Va. W6 ....5.45
Worcester,Mass. W19 ...7.05
Worcester,Mass. A7 ....6.30
Youngstown C8 .....5.95
Youngstown Y1 .....5.45

STRIP, Cold-Rolled Alloy Steel
Carnegie,Pa. S18 .....12.00
Cleveland A7 .....12.00
Dover,O. G6 .....12.00
Fontana,Calif. K1 ....13.65
Harrison,N.J. C18 ....12.00
Pawtucket,R.I.(11) N8 12.15
Pawtucket,R.I.(12) N8 12.45
Sharon,Pa. S3 .....12.00
Worcester,Mass. A7 ..12.30
Youngstown C8 .....12.00

STRIP, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5 .....7.80
Cleveland A7 .....8.15
Dearborn,Mich. D3 ....7.90
Dover,O. G6 .....8.00
Ecorse,Mich. G5 .....8.35
Lackawanna,N.Y. B2 ..8.15
Pittsburgh J5 .....7.80
Sharon,Pa. S3 .....7.65
SparrowsPoint, Md. B2..8.15
Warren,O. R2 .....7.60
Weirton,W.Va. W6 ....8.15
Youngstown Y1 .....8.30

STRIP, Cold-Rolled Ingot Iron
Warren,O. R2 .....6.05

STRIP, Electrogalvanized
Dover,O. G6 .....5.45
Warren,O. B9, T5 .....5.45
Weirton,W.Va. W6 ....5.45
Youngstown C8 .....5.70

TIGHT COOPERAGE HOOP
Atlanta A11 .....4.65
Riverdale,Ill. A1 .....4.50
Sharon,Pa. S3 .....4.35
Youngstown U5 .....4.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A7 American Steel & Wire
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American CladmetalsCo.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co. Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Div. H. K. Porter Co.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Products
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M16 Md. Fine & Special Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman&Scott
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Nrthwst.Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P20 Prod.Steel Strip Corp.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons,JohnA.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S25 StainlessWeldedProducts
S26 Specialty Wire Co. Inc.

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel&Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel
Y1 Youngstown Sheet & Tube

STRIP, Cold-Finished	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Spring Steel (Annealed)					
Beres,O. C7	...	8.00	8.60	10.55	12.85
Bridgeport,Conn.(10) S15	5.75	7.65	8.60	10.55	12.85
Bristol,Conn. W1	...	...	8.90	10.85	....
Carnegie,Pa. S18	...	7.65	8.60	10.55	12.85
Cleveland A7	5.45	7.65	8.60	10.55	12.85
Dearborn,Mich. D3	5.65	7.85	8.80	....	....
Detroit D2	5.65	7.85	8.45	10.55	....
Dover,O. G6	5.45	7.65	8.60	10.55	12.85
FranklinPark,Ill. T6	5.70	7.80	8.75	10.70	13.00
Harrison,N.J. C18	...	...	8.90	10.85	13.15
Mattapan,Mass. T6	6.30	7.95	8.90	10.85	13.15
NewBritn.,Conn.(10) S15	5.75	7.65	8.60	10.55	12.85
NewCastle,Pa. B4	5.45	7.65	8.60	....	....
NewCastle,Pa. E5	5.45	8.00	8.60	10.55	12.85
NewHaven,Conn. D2	5.90	7.95	8.55	10.65	....
NewYork W3	...	7.95	8.90	10.85	13.15
Pawtucket,R.I. (11) N8	....	7.65	8.60	10.55	12.85
Pawtucket,R.I. (12) N8	6.65	7.95	8.90	10.85	13.15
Sharon,Pa. S3	5.45	7.65	8.60	10.55	12.85
Trenton,N.J. R5	...	7.95	8.90	10.85	13.15
Wallingford,Conn. W2	6.20	7.95	8.90	10.85	13.15
Warren,O. T5	5.45	7.65	8.60	10.55	12.85
Weirton,W.Va. W6	5.45	7.65	8.60	10.55	12.85
Worcester,Mass. A7, T6	6.30	7.95	8.90	10.85	13.15
Youngstown C8	...	7.65	8.60	10.55	12.85
Spring Steel (Tempered)					
Buffalo W12	...	...	12.50	....	....
Bristol,Conn. W1	...	...	12.50	15.00	....
FranklinPark,Ill. T6	...	...	13.25	15.75	18.75
Harrison,N.J. C18	...	...	12.50	15.00	18.00
NewYork W3	...	...	12.50	15.00	18.00
Trenton,N.J. R5	...	...	12.50	15.00	18.00
Worcester,Mass. T6	...	...	12.50	15.00	18.00
Worcester,Mass. W12	...	...	12.50	....	....
Youngstown C8	...	...	12.50	15.00	18.00

SILICON STEEL

SHEETS, SILICON, H.R. or C.R.(22Ga.) COILS (Cut Lengths ½c lower)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom W10 (cut lengths)	...	....	8.35	9.60	10.40
Brackenridge,Pa. A4	...	...	8.75	9.75	10.65
GraniteCity,Ill. G4 (cut lengths)	...	....	8.55	9.80	....
IndianaHarbor,Ind. I-2	8.05	8.35	8.85	(34)	....
Mansfield,O. E6 (cut lengths).	7.55	7.85	8.35	9.60	10.40
Newport,Ky. N9 (cut lengths).	....	7.85	8.35	9.60	10.40
Niles,O. N12 (cut lengths)	....	7.55	7.85	8.35	....
Vandergrift U5 (H.R., cut lengths)	...	....	8.15	8.75	9.75	10.65
Warren,O. R2 (H.R.Sheets)	..	7.85	7.15	8.75	9.75	....
Zanesville,O. A10	...	....	8.35	8.85	10.10	10.90

C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)
Fully Processed (Semi-processed ½c lower)

	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
Vandergrift,Pa. U5	8.05*	8.90	9.50	10.50	11.40
Warren,O. R2	8.05†	8.90	9.50	10.50	11.40

*Semi-processed. †Fully processed.

SHEETS, SILICON (22 Ga. Base) COILS (Cut Lengths ½c lower)	Transformer Grade 72	65	58	52
BeechBottom W10 (cut lengths)	10.95	11.50	12.20	13.00
Brackenridge,Pa. A4	11.60	....	....	....
Newport,Ky. N9 (cut lengths).	10.95	....	....	....
Vandergrift,Pa. U5 (cut lengths)	11.60	12.15	12.65	13.65
Warren,O. R2	12.35†	....	....	....
Zanesville,O. A10	11.45	12.00	12.70	13.50

†C.R. coils, annealed; semi-processed ½c lower.

C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	T-100	T-90	T-80	T-73
Butler,Pa. A10	....	....	16.05	16.55
Vandergrift,Pa. U5	13.65	14.65	16.25	16.75

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Fairless,Pa. U5	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	7.65	8.05
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

TIN PLATE, American 1.25 lb Coke (Base Box)	lb	lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Fairless,Pa. U5	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.,Cal. C11	9.45	9.70
Sp.Pt.,Md. B2	8.80	9.05
Warren,O. R2	8.70	8.95
Weirton,W.Va. W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$6.50
Fairfield,Ala. T2	6.60
Fairless,Pa. U5	6.60
Gary,Ind. U5	6.50
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.50
Pittsburg,Calif. C11	7.35
SparrowsPoint,Md. B2	6.60
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)	
Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.10

MANUFACTURING TERNES (Special Coated)	
Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

MANUFACTURING TERNES, 8 lb (Commercial Quality)	
Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

MANUFACTURING TERNES, LT. Coated, 6 lb	
Yorkville,O. W10	$8.65

ROOFING SHORT TERNES (8 lb Coated)	
Gary,Ind. U5	9.75

—WIRE—

WIRE, Manufacturers Bright, Low Carbon	
AlabamaCity,Ala. R2	5.525
Aliquippa,Pa. J5	5.525
Alton,Ill. L1	5.70
Atlanta A11	5.725
Bartonville,Ill. K4	5.625
Buffalo W12	5.525
Chicago W13	5.525
Cleveland A7, C20, R2	5.525
Crawfordsville,Ind. M8	5.625
Donora,Pa. A7	5.525
Duluth,Minn. A7	5.525
Fairfield,Ala. T2	5.525
Fostoria,O. (24) S1	5.75
Houston S5	5.925
Jacksonville,Fla. M8	6.05
Johnstown,Pa. B2	5.525
Joliet,Ill. A7	5.525
KansasCity,Mo. S5	6.125
Kokomo,Ind. C16	5.625
LosAngeles B3	6.475
Minnequa,Colo. C10	5.775
Monessen,Pa. P7	5.525
No.Tonawanda B11	5.525
Palmer,Mass. W12	5.825
Pittsburg,Calif. C11	6.475
Portsmouth,O. P12	5.525
Rankin,Pa. A7	5.525
So.Chicago,Ill. R2	5.525
So.SanFranciso C10	6.475
SparrowsPoint,Md. B2	5.625
Sterling,Ill. (1) N15	5.525
Struthers,O. Y1	5.525
Waukegan,Ill. A7	5.525
Worcester,Mass. A7	5.825

WIRE, MB Spring, High Carbon	
Aliquippa,Pa. J5	6.925
Alton,Ill. L1	7.10
Bartonville,Ill. K4	7.025
Buffalo W12	6.925
Cleveland A7	6.925
Donora,Pa. A7	6.925
Duluth,Minn. A7	6.925
Fostoria,O. S1	6.925
Johnstown,Pa. B2	6.925
LosAngeles B3	7.875
Millbury,Mass. (12) N6	7.225
Minnequa,Colo. C10	7.175
Monessen,Pa. P7	6.925
Monessen,Pa. P16	6.925
Muncie,Ind. I-7	7.125
Palmer,Mass. W12	7.225
Pittsburg,Calif. C11	7.875
Portsmouth,O. P12	6.925
Roebling,N.J. R5	7.225
So.Chicago,Ill. R2	6.925
So.SanFran. C10	7.875
SparrowsPt.,Md. B2	7.025
Struthers,O. Y1	6.925
Trenton,N.J. A7	7.225
Waukegan,Ill. A7	6.925
Worcester A7, J4	7.225
Worcester T6, W12	7.225

WIRE, Upholstery Spring	
Aliquippa,Pa. J5	6.625
Alton,Ill. L1	6.80
Buffalo W12	6.625
Cleveland A7	6.625
Donora,Pa. A7	6.625
Duluth,Minn. A7	6.625
Johnstown,Pa. B2	6.625
LosAngeles B3	7.575
Minnequa,Colo. C10	6.80
Monessen,Pa. P7, P16	6.625
NewHaven,Conn. A7	6.925
Palmer,Mass W12	6.925
Pittsburg,Calif. C11	7.575
Portsmouth,O. P12	6.625
Roebling,N.J. R5	6.925
So.Chicago,Ill. R2	6.625
So.SanFrancisco C10	7.575
SparrowsPoint,Md. B2	6.725
Trenton,N.J. A7	6.925
Waukegan,Ill. A7	6.625
Worcester,Mass. A7	6.925

WIRE, Fine & Weaving(8" Coils)	
Alton,Ill. L1	10.75
Bartonville,Ill. K4	10.65
Buffalo W12	10.55
Chicago W13	10.55
Cleveland A7	10.55
Crawfordsville,Ind. M8	10.65
Fostoria,O. S1	10.55
Jacksonville,Fla. M8	11.08
Johnstown,Pa. B2	10.55
Kokomo,Ind. C16	10.55
Minnequa,Colo. C10	10.30
Monessen,Pa. P16	10.55
Muncie,Ind. I-7	10.75
Palmer,Mass W12	10.85
Roebling,N.J. R5	10.85
So.SanFrancisco C10	10.90
Waukegan,Ill. A7	10.55
Worcester,Mass. A7, T6	10.85

WIRE, Galv'd ACSR for Cores	
Bartonville,Ill. K4	9.50
Buffalo W12	9.50
Johnstown,Pa. B2	9.50
Minnequa,Colo. C10	9.625
Monessen,Pa. P16	9.50
Muncie,Ind. I-7	9.70
Roebling,N.J. R5	9.80
SparrowsPt.,Md. B2	9.60

ROPE WIRE (A)	
Alton,Ill. L1	9.45
Bartonville,Ill. K4	9.35
Buffalo, W12	9.35
Fostoria,O. S1	9.35
Johnstown,Pa. B2	9.35
Monessen,Pa. P7, P16	9.35
Muncie,Ind. I-7	9.55
Palmer,Mass W12	9.65
Portsmouth,O. P12	9.35
Roebling,N.J. R5	9.65
SparrowsPt, B2	9.45
Struthers,O. Y1	9.35
Worcester J4, T6	9.65

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Tire Bead	
Alton,Ill. L1	12.75
Bartonville,Ill. K4	12.65
Monessen,Pa. P16	12.55
Roebling,N.J. R5	12.85

WIRE, Cold-Rolled Flat	
Anderson,Ind. G6	7.45
Buffalo W12	7.45
Cleveland A7	7.45
Crawfordsville,Ind. M8	7.55
Dover,O. G6	7.45
Fostoria,O. S1	7.55
Kokomo,Ind. C16	7.55
FranklinPark,Ill. T6	7.60
Massillon,O. R8	7.45
Monessen Pa. P7, P16	7.45
Pawtkt.,R.I.(12) N8	7.75
Trenton,N.J. R5	7.75
Worcester A7, T6, W12	7.75

WIRE, Merchant Quality (6 to 8 gage)	An'ld. Galv.
Ala.City R2	6.675 7.075**
Aliquippa J5	6.675 7.20*
Atlanta A11	6.775 7.30
Bartonville(48)K4	6.775 7.30
Buffalo W12	6.675 7.075†
Cleveland A7	6.675 ....
Crawfordsville M8	6.775 7.30
Donora,Pa. A7	6.675 7.075†
Duluth,Minn. A7	6.675 7.075†
Fairfield T2	6.675 7.075†
Houston,Tex. S5	7.075 7.475
Jacksonville,Fla. M8	7.20 7.73
JohnstownB2(48)	6.675 7.225*
Joliet,Ill. A7	6.675 7.075†
KansasCity,Mo.S5	7.275 7.675
Kokomo C16	6.775 7.175†
LosAngeles B3	7.625 ....
Minnequa C10	6.925 7.325**
Monessen P7(48)	6.675 7.225
Palmer W12	6.975 7.375†
Pitts.,Calif. C11	7.625 8.025†
Rankin A7	6.675 7.075†
So.Chi'go R2	6.675 7.075**
S.S.Frn.(48)C10	7.625 8.025**
Spar'wsPt.B2(48)	6.775 7.325*
Ster'g(1)(48) N15	6.675 7.20
Struthers,O. Y1	6.675 7.175
Worcester A7	6.975 ....

* Based on 10c zinc; † 5c zinc; ** Subject to zinc equalization extras.

WOVEN FENCE, 9-15½ Ga. Col.	
Ala.City,Ala. R2	140**
Ala.City, 17 ga. R2	235**
Ala.City 18 ga. R2	245**
Alip'ppa,Pa.9-14½ga. J5	143*
Atlanta A11	145
Bartonville,Ill. K4	145
Crawfordsville,Ind. M8	145
Donora,Pa. A7	140†
Duluth,Minn. A7	140†
Fairfield,Ala. T2	140†
Houston,Tex. S5	148
Johnstown,Pa. B2	143
Johnstown 17 ga.,6"B2	234
Johnstown 4" B2	237
Joliet, Ill. A7	140†
KansasCity,Mo. S5	152
Kokomo,Ind. C16	142†
Minnequa,Colo. C10	148**
Monessen,Pa. 9 ga. P7	145
Pittsburg,Calif. C11	163†
Rankin,Pa. A7	140†
So.Chicago,Ill. R2	140**
Sterling,Ill. (1) N15	143

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

BALE TIES, Single Loop	Col.
AlabamaCity,Ala. R2	149
Atlanta A11	151
Bartonville,Ill. K4	151
Crawfordsville,Ind. M8	151
Donora,Pa. A7	149
Duluth,Minn. A7	149
Fairfield,Ala. T2	149
Joliet,Ill. A7	149
KansasCity,Mo. S5	161
Kokomo,Ind. C16	151
Minnequa,Colo.C10	154
Pittsburg,Calif. C11	173
So.Chicago,Ill. R2	149
So.SanFran.,Calif. C10	173
SparrowsPoint,Md. B2	151
Sterling,Ill.(1) N15	149

WIRE, Barbed	Col.
AlabamaCity R2	153**
Aliquippa J5	150*
Atlanta A11	158
Bartonville,Ill. K4	158
Crawfordsville,Ind. M8	158
Donora,Pa. A7	153†
Duluth,Minn A7	153†
Fairfield,Ala. T2	153†
Houston,Tex. S5	161
Johnstown,Pa. B2	156*
Joliet,Ill. A7	153†
KansasCity,Mo. S5	165
Kokomo,Ind. C16	155†
Minnequa,Colo. C10	159**
Monessen,Pa. P7	157
Pittsburg,Calif. C11	173†
Rankin,Pa. A7	153†
So.Chicago,Ill. R2	153**
S.SanFrancisco C10	176**
SparrowsPoint,Md. B2	158*
Sterling,Ill. (1) N15	156

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

WIRE, (16 gage)	An'ld. Galv. Stone	Stone
Ala.City R2	12.50	14.05**
Aliquippa J5	12.50	14.30*
Bartonville K4	12.60	14.40
Buffalo W12	12.50	....
Cleveland A7	12.50	....
Crawfordsville M8	12.50	14.30
Fostoria,O. S1	12.60	14.15
Johnstown B2	12.50	14.35*
Kokomo C16	12.60	14.15†
Minnequa C10	12.75	14.45**
Palmer,Mass.W12	12.50	14.05†
Pitts.,Calif. C11	12.85	14.40†
SparrowsPt. B2	12.60	14.45*
Sterling(1) N15	12.50	14.30
Waukegan A7	12.50	14.05†
Worcester A7	12.80	....

* Based on 11c zinc; †5c zinc; ** Subject to zinc equalization extras.

NAILS, Stock To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	131
Aliquippa,Pa. J5	131
Atlanta A11	133
Bartonville,Ill. K4	133
Chicago,Ill. W13	131
Cleveland A9	137
Crawfordsville,Ind. M8	133
Donora,Pa. A7	131
Duluth,Minn. A7	131
Fairfield,Ala. T2	131
Galveston,Tex. D7	139
Houston,Tex. S5	139
Johnstown,Pa. B2	131
Joliet,Ill. A7	131
KansasCity,Mo. S5	143
Kokomo,Ind. C16	133
Minnequa,Colo. C10	136
Monessen,Pa. P7	131
Pittsburg,Calif. C11	150
Rankin,Pa. A7	131
So.Chicago,Ill. R2	131
SparrowsPt.,Md. B2	133
Sterling,Ill. (1) N15	131
Worcester,Mass. A7	137

NAILS, CUT (100 lb keg) To dealers (33)	
Conshohocken,Pa. A3	$8.00
Wheeling,W.Va. W10	8.00

STAPLES, Polished Stock To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	133
Aliquippa,Pa. J5	133
Atlanta A11	135
Bartonville,Ill. K4	135
Crawfordsville,Ind. M8	135
Donora,Pa. A7	133
Duluth,Minn. A7	133
Fairfield,Ala. T2	133
Johnstown,Pa. B2	133
Joliet,Ill. A7	133
Kokomo,Ind. C16	135
Minnequa,Colo. C10	138
Monessen,Pa. P7	133
Pittsburg,Calif. C11	152
Rankin,Pa. A7	133
So.Chicago,Ill. R2	133
SparrowsPt.,Md. B2	135
Sterling,Ill. (1) N15	133
Worcester,Mass. A7	139

—FENCE POSTS—

	Col.
ChicagoHts.,Ill. C2, I-2	145
Duluth,Minn. A7 (49)	145
Franklin,Pa. F5	145
Johnstown,Pa. B2	145
Marion,O. P11	145
Minnequa, Colo. C10	150
Moline,Ill. R2	145
So.Chicago,Ill. R2	145
Tonawanda,N.Y. B12	148
Williamsport,Pa. S19	158

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Sizes—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25
Ambridge, Pa. N2 (†)	15.75	...	19.75	...	22.25	...	23.75	...	23.75	...	23	...	25.5	...
Lorain, O. N3 (*)	15.75	4.5	19.75	5.5	22.25	8	23.75	9.5	23.75	9.5	23	8.75	25.5	11.25
Youngstown Y1 (††)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2 (**)	15.75	0.75	19.75	3	22.25	5.5	23.75	7	23.75	7	23	6.25	25.5	8.75

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Sizes—Inches	⅛		¼		⅜		½		¾		1		1¼		1½	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c		27.5c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28		2.73	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	...	...	...	...	...	...	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Alton, Ill. L1 (§)	...	...	...	...	...	...	24.25	9	27.25	13	29.75	16.5	32.25	17.5	32.75	18.25
Benwood, W. Va. W10(††)	25.5	+0.25	17.75	+5.5	10.25	+10	26.25	11	29.25	15	31.75	18.5	34.25	19.5	34.75	20.25
Butler, Pa. F6 (†)	26.5	+2.75	19.5	+7.25	12.5	+13	...	..	...	..	...	...	...	...	...	...
Etna, Pa. N2 (†)	...	...	...	...	...	...	26.25	7	29.25	11	31.75	14.5	34.25	16.25	34.75	17.25
Fontana, Calif. K1 (§)	...	...	...	...	...	...	13.25	+3	16.25	1	18.75	4.5	21.25	5.5	21.75	6.5
Ind. Harbor Y1 (††)	...	...	...	...	...	...	25.25	9	28.25	13	30.75	16.5	33.25	17.5	33.75	18.5
Lorain, O. N3 (*)	...	...	...	...	...	...	26.25	16	29.25	20	31.75	23.5	34.25	23	34.75	24
Sharon, Pa. S4 (‡)	26.5	−0.25	19.50	+4.25	12.5	+8.5	...	..	...	..	...	...	...	...	...	...
Sharon, Pa. M6	...	...	...	...	...	...	26.25	11	29.25	15	31.75	18.5	34.25	19.25	34.75	20.25
Sparrows Pt., Md. B2 (§)	24.5	+1.75	17.5	+6.25	10.5	+10.5	24.25	8	27.25	12	29.75	15.5	32.25	16.5	32.75	17.5
Youngstown R2 (**)	...	...	...	...	...	...	26.25	11	29.25	15	31.75	18.5	34.25	19.25	34.75	20.25
Youngstown Y1 (††)	...	...	...	...	...	...	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Wheatland, Pa. W9 (§)	24.5	+1.75	17.5	+6.25	10.5	+10.5	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5

Size—Inches	2		2½		3		3½		4	
List Per Ft	37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	35.25	20	36.75	20	36.75	20	....	....	....	....
Alton, Ill. L1 (§)	33.25	18.75	34.75	18	34.75	18	....	....	....	....
Benwood, W.Va. W10(††)	35.25	20.75	36.75	20.5	36.75	20.5	27.75	11	27.75	11
Etna, Pa. N2 (†)	35.25	17.25	36.75	18.5	36.75	18.5	27.75	9	27.75	9
Fontana, Calif. K1 (§)	22.25	7	23.75	7	23.75	7	....	....	....	....
Ind. Harbor, Ind. Y1 (††)	34.25	19	35.75	19	35.75	19	....	....	....	....
Lorain, O. N3 (*)	35.25	24.5	36.75	23	36.75	23	....	....	....	....
Sharon, Pa. M6	35.25	20.75	36.75	20.5	36.75	20.5	....	....	....	....
Sparrows Pt., Md. B2 (§)	32.25	18	34.75	18	34.75	18	25.75	8.5	25.75	8.5
Youngstown R2 (**)	35.25	20.75	36.75	20.5	36.75	20.5	27.75	11	27.75	11
Youngstown Y1 (††)	35.25	20	36.75	20	36.75	20	....	....	....	....
Wheatland, Pa. W9 (‡)	35.25	20	36.75	20	36.75	20	....	....	....	....

Galvanized pipe discounts based on zinc price of: (†), 14c; (‡), 11c to under 12c; (*), 5c; (§), 10c to under 11c; (††), 10.50c-11.50c; with discounts adjusted on price of zinc at time of shipment.

BOILER TUBES

Net base c.l. prices, dollar per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	21.31	18.44
1¼	13	....	25.24	18.12
1½	13	23.12	27.89	20.01
1¾	13	26.84	32.37	23.66
2	13	30.08	36.28	26.51
2¼	13	34.18	41.23	29.86
2½	12	37.10	44.75	32.41
2½	12	40.51	48.86	35.70
2¾	12	43.85	52.90	38.66
3	12	45.92	55.39	41.23

RAILWAY MATERIALS

Rails	Std. No. 1	Std. No. 2	Std. All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	4.325	4.225	4.275	5.20
Ensley,Ala. T2	4.325	4.225	....	5.20
Fairfield,Ala. T2	....	....	....	5.20
Gary,Ind. U5	4.325	4.225	4.275	...
Huntington,W.Va. W7	....	....	....	5.20
IndianaHarbor,Ind. I-2	4.325	4.225	4.275	...
Johnstown,Pa. B2	....	....	...(16)	5.20
Lackawanna,N.Y. B2	4.325	4.225	....	5.20
Minnequa,Colo. C10	4.325	4.125	....	5.70
Steelton,Pa. B2	4.325	4.225	....	...
Williamsport,Pa. S19	....	....	....	5.20

TIE PLATES

Fairfield,Ala. T2 .....5.125
Gary,Ind. U5 .....5.125
Ind.Harbor,Ind. I-2 ...5.125
Lackawanna,N.Y. B2 ..5.125
Minnequa,Colo. C10 ...5.125
Pittsburg,Calif. C11 ...5.275
Seattle B3 .....5.275
Steelton,Pa. B2 .....5.125
Torrance,Calif. C11 ...5.275

TRACK BOLTS (20) Treated

Cleveland R2 .....11.00
KansasCity,Mo. S5 ....11.00
Lebanon,Pa. B2 .....11.00
Minnequa,Colo. C10 ...11.00
Pittsburgh O3, P14 ....11.00

JOINT BARS

Bessemer,Pa. U5 .....5.275
Fairfield,Ala. T2 .....5.275
Ind.Harbor,Ind. I-2 ...5.275
Joliet,Ill. U5 .....5.275
Lackawanna,N.Y. B2 ..5.275
Minnequa,Colo. C10 ...5.275
Steelton,Pa. B2 .....5.275

AXLES

Ind.Harbor,Ind. S13 ....6.50
Johnstown,Pa. B2 .....6.50

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1 7.05
KansasCity,Mo. S5 .... 7.30
Lebanon,Pa. B2 ..... 7.05
Minnequa,Colo. C10 .... 7.05
Pittsburgh J5 ..... 7.05
Seattle B3 ..... 7.55
So.Chicago,Ill. R2 ..... 7.05
Struthers,O. Y1 ..... 7.05
Youngstown R2 ..... 7.05

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 8.90c
7/16-in. under .....26.5 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

6 in. and shorter:
½-in. & smaller diam. 4
⅝-in. & ⅝-in. 5
¾-in. and larger ... 3
Longer than 6 in.:
All diams. ..... +4
Lag bolts, all diams.:
6 in. and shorter.... 12
Over 6 in. long 8
Ribbed Necked Carriage 5
Blank 25
Plow 25
Step, Elevator, Tap and Sleigh Shoe 12
Tire Bolts ..... List
Boiler & Fitting-Up Bolts 23

NUTS

H.P. & C.P., regular & heavy:
Square, all sizes 58
H.P., Hex, regular & heavy:
¾" and smaller 58
⅞" to 1¼", inclusive. 60
1⅛" to 1½", inclusive 62
1⅝" and larger 58
C.P. Hex, regular heavy:
All sizes 58
Hot Galv. Nuts (all types):
¾" and smaller 40
⅞" to 1½", inclusive. 43
Finished Hex Nuts:
New standard, all sizes 58
Semifinished & Slotted Hex.:
Regular and heavy, all sizes 58

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam x 6 in. and shorter 34
1 in. and smaller diam. x over 6 in. 20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller 34
¼-in. diam. & larger... 14
N.F. thread, all diams.. 8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish .....47.5 & 10
Plated finishes ..... 30 x 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:
⅝-in. & smaller 38
¾-in. through 1 in. .. 22
Longer than 6 in.:
⅝-in. and smaller ... 20
¾-in. through 1 in. .. 7

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron:	
98+% Fe, annealed.	18.00
Unannealed	14.50
Swedish, c.l.f. N.Y., c.l., in bags	11.25
Electrolytic iron:	
Annealed, 99.5% Fe.	42.50
Unannealed (99+% Fe)	36.50
Unannealed (99+% Fe) (minus 325 mesh)	53.50
Powder Flakes (minus 16, plus 100 mesh)..	31.00
Carbonyl Iron:	
97.9-99.8% size 5 to 10 microns..83.00-148.00	
Aluminum:	
Atomized, 500 lb drums, freight allowed:	
Carlots	31.00
Ton lots	34.00
Antimony, 500 lb lots.	32.00*
Brass, 20-ton lots.	29.25-36.50
Bronze, 10-ton lots	51.00-60.00
Copper:	
Electrolytic	13.50*
Reduced	13.50*
Lead	7.50*
Magnesium	75.00-85.00
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel unannealed	89.50
Nickel-Silver 5-ton lots	47.00
Silicon	43.50
Solder	8.50*
Stainless Steel, 302 ...	91.00
Tin	14.00*
Zinc, 10-ton lots..	17.50-25.00

Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over ...	5.35
Less than 1000 lb ..	5.50
Chromium, electrolytic 99.9% Cr min.	3.60

*Plus cost of metal.

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛" to 1 7/16"; 1 7/16" to 1 15/16" 4.58c; 1 15/16" to 7 5/16" 4.95c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) 3/8" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 5.40c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon and 0.35c for H.S.-L.A.
(31) Base; deld. within mill county.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 gage & lighter; 60" & narrower.
(38) 14 gage & lighter; 48" and narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(48) 6-7 gage.
(49) T-post; deduct 2 cols. for U-post.

STAINLESS STEEL MILL PRICES

(Representative prices, cents per pound; subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	H.R. Strip	Shapes; H.R. & C.F. Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.25	20.50	29.50	34.25	29.75	35.25	37.25	46.25	38.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50	46.50	41.50
302B	18.50	24.50	30.50	34.50	35.00	35.50	37.50	48.75	44.75
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75	48.75	45.50
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75	48.75	43.75
304L	....	....	36.75	....	....	42.75	45.25	54.25	49.00
306	19.50	25.50	....	36.25	37.00	37.50	42.00	51.75	46.75
308	19.75	26.25	35.25	40.75	38.00	42.00	46.00	55.25	48.00
309	26.50	34.75	43.25	49.25	49.25	50.50	53.75	63.50	62.00
309S	28.50	37.50	47.50	54.50	54.00	55.50	59.00	68.50	68.50
310	33.00	43.25	56.75	66.25	67.50	67.50	69.00	72.25	78.75
314	....	....	....	....	....	....	69.00	74.50	....
316	28.00	36.25	46.75	54.50	55.00	55.50	59.00	64.50	66.50
316L	....	....	52.50	....	....	61.00	64.25	70.00	72.00
317	33.00	43.50	58.25	66.75	67.50	68.25	70.75	77.00	79.25
318	33.50	44.00	55.25	64.50	66.25	65.50	68.75	78.00	80.25
321	22.75	29.50	35.25	40.75	42.00	42.00	46.00	55.50	54.50
330	....	....	58.00	....	....	68.50	70.00	73.75	77.75
347	24.50	32.25	39.50	45.75	46.50	46.75	51.25	60.75	59.25
403	....	....	27.00	30.75	....	32.00	34.25	44.00	41.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	42.50	39.75
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	40.75	34.25
416	....	....	24.50	28.25	....	29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	49.25	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	43.50	34.75
430F	....	18.75	25.00	28.75	....	29.75	31.00	44.00	44.00
431	14.50	28.50	25.00	28.25	27.50	29.25	30.50	44.00	35.25
440A,B,C	....	28.50	29.25	34.00	....	35.00	38.50	49.25	52.75
442	....	....	28.00	....	....	30.50	35.25	48.25	47.75
446	....	....	....	33.75	38.25	53.00	39.50	49.75	59.75	71.00
501	....	....	....	14.00	14.50	21.25	16.00	18.25	30.50	29.00
502	....	....	....	15.25	16.00	22.25	17.00	20.00	31.75	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Shenango Agaloy Tube Co.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

CLAD STEEL

Cladding Stainless	Plates: Carbon Base 10%	Plates: Carbon Base 20%	Sheets: Carbon Base 20%	Sheets: Copper Base Both Sides
302	....	31.00	31.00	77.00
304	27.60	32.50-32.70	32.50	77.00
310	36.50	41.00	.....	144.00
316	32.60	37.70-42.75	42.75	....
318	37.00	42.20	.....	....
321	29.30	34.40-37.00	37.00	111.00
347	30.40	35.50-40.50	40.50	130.00
405	23.40	30.60	.....	....
410	22.90	30.10	.....	....
430	22.90	30.10	.....	....
Inconel	41.23	54.18	.....	165.00
Nickel	37.50	50.90	.....	....
Monel	38.90	51.80	.....	....
Copper*	....	.....	46.00	....

	Strip, Carbon Base: Cold-Rolled 10%	Cold-Rolled Both Sides	Hot-Rolled 10%	Hot-Rolled Both Sides
Copper*	27.85	35.85	24.00	32.25

*Deoxidized. Production points: Stainless sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates Coatesville L7; copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A13.

TOOL STEEL

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.25-.285	5% Cr Hot Work	0.39
Extra Carbon	0.30-.340	W-Cr Hot Work	0.41
Special Carbon	0.35-.360	V-Cr Hot Work	0.43
Oil Hardening	0.370-.39	Hi-Carbon-Cr.	0.665-.70

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	4.055
18.25	4.25	1	4.75	...	2.320-2.340
18	4	2	9	...	2.565-2.695
18	4	2	....	...	1.820
18	4	1	....	...	1.480-1.660
13.5	4	3	....	...	1.875
6.4	4.5	1.9	....	5	1.005-1.065
6	4	3	....	6	1.24-1.300
2	1.4	1.2	....	..	0.495
1.5	4	1	....	8.5	0.895

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

PIG IRON Gross Ton

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
AlabamaCity R2	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	....	....
Woodward,Ala. W15	52.38	52.88	56.50†	....
Cincinnati, deld.	....	60.43	....	....
Buffalo District				
Buffalo R2, H1	56.00	56.50	57.00	....
Tonawanda,N.Y. W12	56.00	56.50	57.00	....
No.Tonawanda,N.Y. T9	....	56.50	57.00	....
Boston, deld.	66.65	67.15	67.65	....
Rochester,N.Y., deld.	59.02	59.52	60.02	....
Syracuse,N.Y., deld.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Gary,Ind. U5	56.00	....	56.50	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	....
So. Chicago,Ill. U5	56.00	....	56.50	57.00
Milwaukee, deld.	58.17	58.67	58.67	59.17
Muskegon,Mich., deld.	....	62.80	62.80	....
Cleveland District				
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	....
Akron,O., deld. from Cleve.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem,Pa. B2	58.00	58.50	59.00	59.50
New York, deld.	....	62.28	62.78	....
Newark, deld.	61.02	61.52	62.02	62.52
Philadelphia, deld.	60.75	61.25	61.75	62.25
Birdsboro,Pa. B10	58.00	58.50	....	....
Steelton,Pa. B2	58.00	58.50	59.00	59.50
Swedeland,Pa. A3	58.00	58.50	59.00	59.50
Troy,N.Y. R2	58.00	58.50	59.00	....
Pittsburgh District				
Nevillelsland,Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Ambridge, Aliquippa, deld.	57.37	57.87	57.87	58.37
McKeesRocks, deld.	57.04	57.54	57.54	58.04
Lawrenceville,Homestead, Wilmerding,Monaca, deld.	57.66	58.16	58.16	58.66
Verona,Trafford, deld.	58.19	58.69	58.69	59.19
Brackenridge, deld.	58.45	58.95	58.95	59.45
Bessemer,Pa. U5	56.00	....	56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U5	56.00	....	....	....
McKeesport,Pa. N3	56.00	....	....	57.00
Midland,Pa. C18	56.00	....	....	....
Monessen,Pa. P7	56.00	....	....	....
Youngstown District				
Hubbard,O. Y1	....	....	56.50	....
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield,O., deld.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie,Pa. I-3	56.00	56.50	56.50	57.00
Everett,Mass. E1	59.50	63.00	63.50	....
Fontana,Calif. K1	62.00	62.50	....	....
Geneva,Utah C11	56.00	56.50	....	....
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	56.00	56.50	....	....
LoneStar,Texas L6	52.00	52.50*	52.50	....
Minnequa,Colo. C10	58.00	59.00	59.00	....
Rockwood,Tenn. T3	....	....	56.50	....
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, deld.	61.76	62.26	....	....

*Low phos southern grade. †Phos., 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson,O. G2, J1	$67.00
Buffalo H1	68.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.45 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$91.00
Keokuk,Iowa, Openhearth & Fdry, freight allowed K2	92.00
Keokuk, OH & Fdry, 12½ lb piglets, 16% Si, frt, allowed K2	95.00
Wenatchee,Wash. OH & Fdry, freight allowed K2	92.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$61.00
Rockwood,Tenn. T3	70.00
Steelton,Pa. B2	64.00
Philadelphia, deld.	67.55
Troy,N.Y. R2	64.00

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(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 30 cents; Philadelphia, 25 cents; Birmingham, Cincinnati, St. Paul, 15 cents; Seattle and Spokane, Wash., no charge.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††‖		Carbon	Floor
Baltimore	6.20	7.64	7.78	7.00	...	6.86	8.17[6]	12.04	6.98	6.85	7.98
Birmingham	6.10	7.00	8.00[3]	6.30	...	6.15	8.90	....	6.35	6.35	8.65
Boston	6.89	7.83	9.18	7.13	...	6.87	8.35	12.28	7.06	7.13	8.26
Buffalo	6.18	7.15	8.96	6.79	...	6.35	7.70	12.17	6.59	6.68	7.88
Charlotte, N. C.	6.95	7.80	8.69	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.18	7.12	8.00	6.42	...	6.28	7.30	11.75	6.46	6.33	7.46
Cincinnati	6.51	7.19	8.42	6.72	...	6.58	7.66	12.17	6.93	6.80	7.88
Cleveland	6.18	7.12	7.90	6.58	...	6.34	7.40	11.89	6.79	6.50	7.79
Detroit	6.38	7.29	8.27	6.69	7.36	6.56	7.60	11.92	6.90	6.80	7.80
Erie, Pa.	6.19	7.13	9.01	6.64	...	6.28	7.65[6]	....	6.56	6.50	7.79
Houston	7.15	7.60	9.40	7.45	9.30	7.45	9.30	....	7.35	7.20	8.55
JerseyCity,N.J.	6.54	7.45	8.42	6.82	...	6.75	8.43[6]	11.84	6.50	6.67	8.01
Los Angeles	7.25	9.00	9.35	7.55	11.20	7.15	9.10	13.05	7.35	7.20	9.25
Milwaukee	6.35	7.29	8.17	6.59	...	6.45	7.57	11.92	6.63	6.50	7.63
Moline, Ill.	6.53	7.47	8.36	6.77	...	6.63	7.65	....	6.81	6.68	...
New York	6.54	7.45	8.42	6.82	...	6.75	8.43[6]	11.84	6.50	6.67	8.01
Newark, N. J.	6.78	7.75	8.42	7.16	...	7.06	8.43[6]	....	6.90	6.99	8.30
Norfolk, Va.	6.90	...	...	7.20	...	7.20	8.50	....	7.20	7.15	7.85
Philadelphia	6.17	7.13	7.90	7.02	8.89	6.87	8.19[6]	11.89	6.67	6.63	7.85
Pittsburgh	6.18	7.12	8.00	6.55	...	6.28	7.65	11.89	6.46	6.33	7.46
Portland, Oreg.	8.15	8.70	9.40	7.90	...	7.60	10.65	....	7.50	7.55	9.40
Richmond, Va.	6.50	7.45	8.00	7.10	...	7.05	7.95	....	7.10	6.85	8.10
St. Louis	6.48	7.42	8.30	6.72	...	6.58	7.70	12.06	6.86	6.73	7.86
St. Paul	6.84	7.78	8.66	7.08	...	6.94	8.06	....	7.12	6.99	8.12
San Francisco	7.35	8.70	10.15	7.60	...	7.15	9.75	13.05	7.25	7.20	9.25
Seattle	8.15	9.50	9.80	8.00	...	7.60	10.65	13.50	7.50	7.60	9.40
Spokane	8.15	9.40[1]	9.80	7.60	...	7.60	10.55[5]	14.15	7.25	7.35	9.80
Washington	6.71	8.15	8.35	7.51	...	7.37	8.43	....	7.49	7.36	8.49

*Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extras excluded); ‡ includes 35-cent special bar quality extra; ‖ as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, and cold-finished bars, 2000 lb and over, except in Seattle where base is 2000 to 9999 lb; [3]—500 to 9999 lb; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—1500 lb to 3999; [8]—under ½ in.

Warehouse Steel Sales Rise Slowly

Business regains preholiday volume and is expected to show marked improvement in March and April. Competition among distributors intensifies

New York—Based on number of orders received, steel warehouses are fairly active. But individual purchases are small and total sales volume is relatively light. Cautious fill-in procurement is the policy of most consumers. This type of buying indicates inventories are lower with more gaps appearing in consumer stocks.

Alloys are notably slow, reflecting cuts in defense contracts, also less sub-contracting. Alloy bars have slackened materially. Steel required for aircraft is slowed by stretchouts, but other defense contracts, some fuze and tank subs, have been cut back sharply.

Warehouses are following procurement trends, and, with inventories well balanced, are placing mill orders only for replacement.

Philadelphia—Warehouse business is better than during the last two weeks of December, when yearend influences had marked effect but it is barely holding its own with the pre-holiday volume. Distributors look for moderately good business through February, with a greater stepping up in activity after that. Historically, March and April are among the best months of the year.

Boston — Distributors are amply supplied with carbon sheets and specialties. Easing in availability of steel is nowhere better demonstrated than in this complete reversal in flat-rolled, although small bar and plate stocks closely parallel the rebound.

Sales volume is recovering slowly from the fourth quarter slump, orders increasing in number. Competition is sharper and scattered weakly held steel is available at price concessions.

Cleveland—Warehouse order volume has picked up since opening of the new year but distributors are not under anything like the demand pressure of a year ago. Consumers still are ordering sparingly. Orders are more numerous than they were some weeks back but it is doubtful if total volume is up much.

Warehouse stocks are in better balance than has been the case for a long time past. Consequently, the distributors are in position to give prompt shipment on most items. Cognizant of improved supply conditions all around, buyers are pressing for concessions as competition among the separate warehouses intensifies.

Chicago—Warehouse sales of steel are at somewhat higher level than during the last two weeks of December. It would appear that January volume will exceed that of December. Next two weeks are expected to indicate the first quarter trend in consumer requirements. Meanwhile, inventories are improving and are coming close to full balance.

Cincinnati — Inventory-taking has put warehouse volume at a low level. Stock position of companies in this area is difficult to determine, but it seems likely replacement buying will begin at end of this month.

Pittsburgh—Warehouse sales in December, a traditionally slow month, were no lower than one year earlier. Business is improving, but more slowly than last year. No marked pickup in shipments is likely before March. Stocks are not completed to the optimum point, especially at small warehouses. During periods of scarcity special types of steel were not obtainable. Now distributors are rounding out their supply of those types.

St. Louis—Warehouse steel stocks have climbed beyond the maximum tonnage wanted. Customers' inventories have fallen, but not yet to the reordering point. The result is

warehouses are absorbing freight to old customers and wherever else it is necessary to meet competition. The last two weeks, however, have reduced pessimism in the market and predictions of coming price cutting have vanished. Wide flange beams are still in relatively short supply.

Seattle—Warehouse order volume has increased but buying has not yet attained normal seasonal levels. The outlook for business is considered promising though the turnover is not expected to reach seasonal peaks until late this quarter. Distributors' inventories are well balanced. Plates and sheets are reported in good supply. Competition is keener, but prices are unchanged.

Wire . . .

Wire Prices, Page 114

Boston — Openings in wire mill schedules make possible prompt delivery on many items and retard bookings for February. Most buyers are limiting orders to patching out inventories. While orders for automotive consumption are higher, volume from this source is below expectations so far.

Semifinished Steel . . .

Semifinished Prices, Page 112

Chicago—Inland Steel Co. now has annual rated production capacity of 4,700,000 ingot tons of steel, an increase of 200,000 tons over the past year. The increase resulted from enlargement of four open-hearth furnaces at the Indiana Harbor works, incorporation of improved design in rebuilding, and adoption of improved operating practices.

Pittsburgh—A blooming mill at the Aliquippa Works of Jones & Laughlin Steel Corp. rolled a record high of 576 ingots in one turn Jan. 3. The new record resulted in 2543 production tons. In setting this record, the mill averaged 72 ingots per hour, with a high mark of 76 in one hour. Each ingot weighed five tons.

Los Angeles—Western mills set new steel production records last year. Colorado Fuel & Iron Corp.'s 16 open hearths produced 1,512,503 tons of ingots, 1.4 per cent more than in 1951. Kaiser Steel Corp.'s 9 open-hearth furnaces at Fontana, Calif., produced 1,528,648 tons of ingots, 10 per cent more than during 1952.

San Francisco—Steelmaking rate is rising in this immediate district. The rate on average is above 55 per cent, compared with a low of 36 per cent that prevailed just before the close of 1953.

Up Prices on Some Imported Steel

European mills advance quotations on several products for sale here. Move comes as surprise to importers in view of the current lag in demand. Some items hold unchanged

New York—Despite lagging demand in this country, steel producers in the western continental European (Schuman Plan) countries have advanced prices on several products for sale in the United States.

Importers are puzzled by the move, although internal needs on the other side are said to be stepping up with substantial business being booked by European mills for shipment to Central and South America; also Cuba.

Merchant and deformed bars have been advanced 10 cents per hundred pounds to $4.65 and $4.75, respectively, landed, North Atlantic ports, duty paid. Bar size angles, structural angles and I-beams have been increased 9 cents to $4.39, landed, North Atlantic ports, duty paid.

Wire rods, Thomas commercial No. 5, and wire rods, open hearth, cold heading quality No. 5, have been advanced 9 cents per hundred pounds to $4.77 and $5.23, respectively, landed, North Atlantic ports, duty paid. Channels also have been boosted 9 cents to $4.49 per hundred pounds.

Prices on these products have also been advanced correspondingly at South Atlantic, Gulf Coast and West Coast ports. All other leading products, such as wide flange beams, sheets and plate, barbed wire, nails and pipe, are being quoted unchanged by these western continental European countries.

Iron and steel imports into this country last year are estimated to have averaged 225,000 net tons monthly. This was a sharp increase compared with average monthly imports of 152,127 tons in 1952, but was down substantially from the average monthly intake of 326,858 tons in 1951.

Meanwhile, exports of iron and steel from this country during 1953 averaged 285,000 tons monthly. This compares with 402,839 tons monthly in 1952 and with 316,977 in 1951.

Sheets, Strip . . .

Sheet and Strip Prices, Page 112 A 113

Boston—Higher extras have been brought into line, revised in some cases to lower standard level, notably on galvanized sheets. While placing February orders conservatively, consumers are still buying hand-to-mouth, stressing prompt delivery.

A limited number of consumers with automotive parts orders have gone into March, but the evidence is clear that steel orders to meet projected automobile building programs for first half are not coming out in the volume expected.

Heavy stocks of straight chromium stainless are yet to be liquidated to the point where higher nickel grades are in more active demand.

New York—Hand-to-mouth buying dominates the sheet market. Consumers are building up inventories a little, but, in the main, they are limiting purchases to specific needs. Improvement in buying since the beginning of the year has been slight.

STEEL IMPORT PRICES

(Base, per 100 lb, landed, duty paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A-305	$4.75	$4.85	$4.75	$5.00
Bar Size Angles	4.39	4.49	4.39	4.67
Structural Angles	4.39	4.49	4.39	4.67
I-Beams	4.39	4.49	4.39	4.67
Wide Flange Beams	4.94	5.02	4.94	5.22
Sheet and Plate, 10 gage, 11 gage, 5' x 10'	5.87	5.95	5.87	6.25
Furring Channels, C.R., 1000 ft, ⅞ x 0.30 lb per ft	25.00	25.70	25.50	26.34
Barbed Wire	6.20	6.30	6.20	6.48
Merchant Bars	4.65	4.75	4.65	4.93
Hot Rolled Bands	4.65	4.75	4.65	4.93
Wire Rods, Thomas Commercial No. 5	4.77	4.84	4.82	5.09
Wire Rods, O-H, Cold Heading Quality No. 5	5.23	5.30	5.28	5.55
Channels	4.49	4.59	4.49	4.77
Bright Common Wire Nails, 8d	6.55	6.65	6.60	6.85

Size O.D.	Wgt/Foot/Lb	Gulf Port	West Coast	Vancouver
Seamless A.P.I. Casing, Grade J-55:				
5½ in.	15.5	$1.47/ft	$1.51/ft	$1.52/ft
7 in.	23	2.10/ft	2.17/ft	1.90/ft
Seamless N-80 Casing:				
5½ in.	17	1.94/ft	2.00/ft	1.75/ft
7 in.	23	2.50/ft	2.70/ft	2.36/ft
Seamless J-55 Tubing:				
2⅜ in.	4.7	0.60/ft	0.63/ft	0.55/ft
2⅞ in.	6.5	0.80/ft	0.83/ft	0.73/ft

Sources of shipment: Western continental European (Schuman Plan) countries.

Producers look for the over-all trend to be upward throughout the quarter, with March the most active month.

Philadelphia—Sheet sellers anticipate a slightly better month in February than in January. Automotive business is a shade more promising and some household appliance lines should be picking up by that time. An additional consideration for some encouragement is the fact that consumer inventory adjustment has just about run its course.

Record Steel Output Set In 1953

Preliminary data show production topped previous record set in 1951 by 6.4 million net tons. Nation accounts for 44 per cent of world total during year

New York—Steel production set a new high record of 111,600,445 net tons in 1953, the American Iron & Steel Institute reports, based on a preliminary survey for the year. This was 18,432,406 tons greater than output in 1952, and was 6.4 million tons above the previous annual production record set in 1951.

December production of ingots and steel for castings amounted to 7,937,000 net tons, comparing with the revised figure of 8,690,106 tons in November and 9,691,074 tons in December, 1952.

American production of steel last year was 44 per cent of the world's estimated output of about 255 million net tons. This was equal to the combined production of the eight next ranking countries, based on preliminary estimates. In 1952 U. S. production made up 40 per cent of the world's estimated total of steel output.

The American Iron & Steel Institute's new index of steel production, based on average output in 1947 to 1949 as 100, was 133.2 for 1953, comparing with 110.9 for 1952 and 125.6 for 1951.

As of Jan. 1, 1954, the annual capacity for ingots and steel for castings is 124.3 million tons. As much steel can now be produced at 83 per cent of capacity as could have been produced at 100 per cent in the boom year of 1951.

Comparative production figures for 1952 and 1953 follow:

	OPEN-HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated	No. of
1953	Net tons	% of capacity	Net tons	% of capacity	Net tons	% of capacity	Net tons	% of capacity	weekly production (net tons)	weeks in mos.
January	8,841,679	101.4	350,200	88.9	706,083	81.2	9,897,962	99.1	2,234,303	4.43
February	7,939,299	100.8	329,389	92.6	664,091	84.6	8,932,779	99.1	2,233,195	4.00
March	9,050,773	103.7	354,710	90.0	762,615	87.7	10,168,098	101.8	2,295,282	4.43
1st Qtr.	25,831,751	102.0	1,034,299	90.4	2,132,789	84.5	28,998,839	100.0	2,254,964	12.86
April	8,493,909	100.5	334,605	87.7	717,024	85.2	9,545,538	98.7	2,225,067	4.29
May	8,925,163	102.3	354,577	90.0	717,340	82.5	9,997,080	100.1	2,256,677	4.43
June	8,394,502	99.4	332,060	87.0	677,917	80.5	9,404,479	97.2	2,192,186	4.29
2nd Qtr.	25,813,574	100.8	1,021,242	88.3	2,112,281	82.7	28,947,097	98.7	2,224,988	13.01
1st 6 Mo.	51,645,325	101.4	2,055,541	89.3	4,245,070	83.6	57,945,936	99.4	2,239,889	25.87
July	8,316,342	95.5	324,068	82.4	635,263	73.2	9,275,673	93.1	2,098,569	4.42
August	8,463,155	97.0	310,074	78.7	632,351	72.7	9,405,580	94.2	2,123,156	4.43
Sept.	8,076,277	95.8	287,638	75.6	519,513	61.9	8,883,428	92.1	2,075,567	4.28
3rd Qtr.	24,855,774	96.1	921,780	78.9	1,787,127	69.4	27,564,681	93.1	2,099,366	13.13
9 Mos.	76,501,099	99.6	2,977,321	85.8	6,032,197	78.8	85,510,617	97.3	2,192,580	39.00
Oct.	8,648,428	99.1	325,250	82.6	489,044	56.3	9,462,722	94.7	2,136,055	4.43
*Nov.	8,002,403	94.7	283,321	74.3	404,382	48.0	8,690,106	89.9	2,025,666	4.29
†Dec.	7,322,000	84.1	270,000	68.7	345,000	39.8	7,937,000	79.7	1,796,000	4.42
†4th Qtr.	23,972,831	92.6	878,571	75.2	1,238,480	48.0	26,089,828	88.1	1,985,527	13.14
†Last Half	48,828,605	94.4	1,800,351	77.1	3,025,553	58.7	53,654,509	90.6	2,042,425	26.27
†Total	100,473,930	97.9	3,855,892	83.2	7,270,623	71.1	111,600,445	94.9	2,140,400	52.14
1952										
1st Qtr.	24,207,329	102.5	1,168,871	87.4	1,824,524	89.1	27,200,724	100.7	2,092,363	13.00
April	7,101,199	91.1	323,006	73.2	567,935	84.1	7,992,140	89.7	1,862,970	4.29
May	7,291,865	90.6	318,642	69.9	595,135	85.3	8,205,642	89.2	1,852,289	4.43
June	1,446,927	18.6	22,862	5.2	170,000	25.2	1,639,789	18.4	382,235	4.29
2nd Qtr.	15,839,991	67.0	664,510	49.6	1,333,070	65.1	17,837,571	66.0	1,371,066	13.01
1st 6 Mo.	40,047,320	84.8	1,833,381	68.5	3,157,594	77.1	45,038,295	83.4	1,731,576	26.01
July	1,347,587	16.8	2,000	0.4	277,859	39.9	1,627,446	17.7	368,200	4.42
August	7,599,888	94.4	309,361	67.8	590,476	84.6	8,499,725	92.4	1,918,874	4.43
Sept.	8,039,128	103.4	351,620	79.8	672,539	99.8	9,063,287	102.0	2,117,590	4.28
3rd Qtr.	16,986,603	71.2	662,981	49.1	1,540,874	74.5	19,190,458	70.4	1,461,573	13.13
9 Mos.	57,033,923	80.2	2,496,362	62.0	4,698,468	76.2	64,228,753	79.0	1,641,000	39.14
Oct.	8,747,640	108.7	347,042	76.1	713,402	102.3	9,808,084	106.6	2,214,014	4.43
Nov.	8,396,227	107.7	336,902	76.3	706,999	104.7	9,440,128	105.9	2,200,496	4.29
Dec.	8,668,930	108.0	343,371	75.5	677,861	97.4	9,690,162	105.6	2,192,344	4.42
4th Qtr.	25,812,797	108.1	1,027,315	76.0	2,095,766	101.3	28,935,878	106.0	2,202,122	13.14
Last Half	42,799,400	89.7	1,690,296	62.5	3,633,932	87.8	48,123,628	88.2	1,831,885	26.27
Total	82,846,720	87.2	3,523,677	65.5	6,785,978	82.4	93,156,375	85.8	1,781,874	52.28

Note—The percentages of capacity in 1953 are calculated on weekly capacities of 1,969,275 net tons open-hearth, 88,934 net tons bessemer and 196,250 net tons electric ingots and steel for castings, total 2,254,459 net tons; based on annual capacities as of Jan. 1, 1953, as follows: Open-hearth 102,677,980 net tons, bessemer 4,637,000 net tons, electric 10,232,490 net tons, total 117,547,470 net tons. The percentages of capacity operated in 1952 are calculated on weekly capacities of 1,816,637 net tons open-hearth, 102,926 net tons bessemer and 157,477 net tons electric ingots and steel for castings, total 2,077,040 net tons; based on annual capacities as of Jan. 1, 1952, as follows: Open-hearth 94,973,780 net tons; bessemer 5,381,000 net tons; electric 8,232,890 net tons; total 108,587,670 net tons.

*Revised.
†Preliminary figures, subject to revision.

Cleveland—Sheetmakers are comfortably booked for January and are in receipt of a rising volume of orders for February and March. Expectations are first quarter volume will fall only slightly under that of a year ago despite the fact buyers currently are not ordering as far ahead as formerly, many buying only for needs in sight. Easier supply conditions encourage closer specifying to needs and less dependence on inventories.

Cincinnati — Volume offerings of sheets at cut prices appear subsiding. Selling of excess sheet tonnages has made it next to impossible to ascertain true market conditions.

Chicago — Except for Ford and General Motors, which are seeking increased tonnages of sheets for first quarter, demand for flat-rolled steel currently isn't as strong as previously estimated. Some independent car buiders have cut back their requirements or deferred shipments. Sheet production facilities will not be fully committed this month and there are openings for February and March.

St. Louis—Orders for sheets trickle in slowly, with first quarter books still unfilled. Consumers remain cautious and intent on working off inventories.

Tubular Goods . . .

Tubular Goods Prices, Page 115

Pittsburgh—Caution is the watchword in ordering buttweld pipe. Orders are carefully planned on basis of actual need. Seamless grades enjoy brisk sales, especially in tubing for oil country use.

Blaw-Knox Co., Pittsburgh, received a $1.2 million order from the Atomic Energy Commission for 1240 tons of prefabricated piping for use in a new gaseous diffusion plant at Portsmouth, O.

Seattle—Cast iron pipe sales agencies anticipate marked improvement in demand shortly. The market has been extremely quiet the past three months.

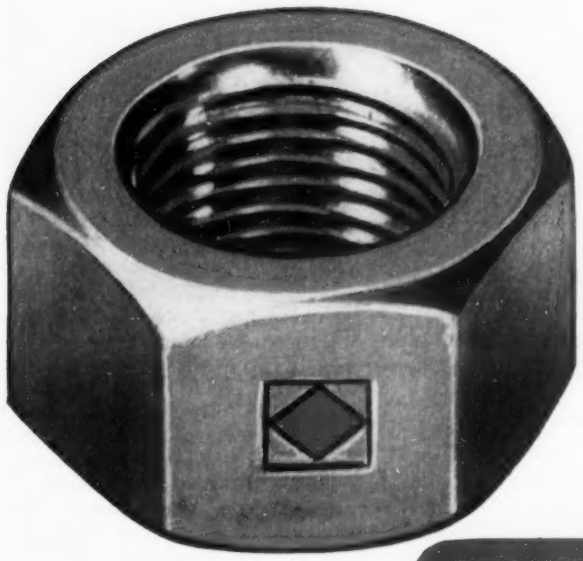
For automatic assembly or piecework

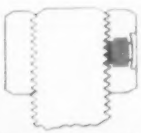
REPUBLIC "NYLOK"* NUTS GO ON FAST

There is no need to turn a Republic "Nylok" Nut end-for-end to get it right-side-up. Either end goes on fast and easy. This advantage saves you man-hours. It means you can feed Republic "Nylok" Nuts at full production speed on your automatic assemblies. Or use them manually for piecework assembly.

Nylon plugs keep these lock-nuts tight wherever you stop wrenching. Republic "Nylok" Nuts are easy to back-off and can be safely re-used.

Write for samples, indicating sizes required.





SIZES

Light series tapped ¼" thru ⅝"
Light thick series tapped ¼" thru ½"
Regular sizes tapped ¼" thru ½"
Heavy series tapped ¼" thru ½"

Here's how the "Nylok" principle works: A nylon plug inserted in one of the sides of the cold-forged nut forces the nut tightly against the opposite threads as the nut is turned on.

12 WAYS BETTER

Assemble from either end	No special tools
Can be re-used	One piece
Non-galling	Ideal for mechanical feeding
Best wrenching characteristics	No lubricant needed
Won't damage threads	Cold-forged
No special know-how	Lock in any position

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Bolt and Nut Division • CLEVELAND 13, OHIO
Export Department: Chrysler Building, New York 17, N.Y.

*U. S. Pat. No. 2,462,603 and No. 2,450,694 and pending applications.

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USE "HARD-DUR" GEARS

they preserve the tooth form

• "HARD-DUR" Gears not only preserve tooth form because the material is highly wear resistant and the gears are scientifically heat treated to obtain maximum physical properties...but they have involute teeth that are produced to high standards of accuracy by very careful workmanship. In fact "HARD-DUR" Gears are so much stronger, harder and more wear-resistant, that they are guaranteed to have at least four or five times the life of similar untreated gears...and at only 50% extra in cost.

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Send note on Company Letterhead for 488-Page Catalog 49

Steel Bars . . .

Bar Prices, Page 112

Chicago—Bar consumption, both hot-rolled and cold-finished, is suffering from the low ebb of farm equipment production. The fact that Deere & Co. is calling back 500 to 1000 recently furloughed employees at its Waterloo, Iowa tractor works by Feb. 1 because of a firming up in demand for tractors is encouraging. Another tractor maker also is lifting output schedules on one of its larger models slightly.

For the airfield depot, Topeka, Kan., bids close Jan. 21 on 608 tons, cold-finished annealed steel bars; 321 tons are flats, 237 tons rounds and the balance squares. Same contracting office closes on 220 tons, chromium-nickel sheets Jan. 26.

Boston—More mill stock list cold-finished bar tonnage is available for prompt delivery. Demand for early shipment is encouraged by some open capacity for late January. Bookings for February reflect slight change toward forward buying.

Alloy trade outlook is dampened by defense order cutbacks. Forge shops producing for the automobile industry are slightly more active. Cold-finishing converters are holding orders to new requirements.

New York—Ability of bar consumers to obtain nearby delivery on most specifications desired is being reflected in buying policies. There is little advance buying. Various users have not yet entered the market for their full February requirements. Until recently some of them have been filling in their January needs.

This contrasts sharply with conditions only a few months back. Then consumers were buying ahead without much regard as to their specific needs. Today they can wait until they know precisely what they want.

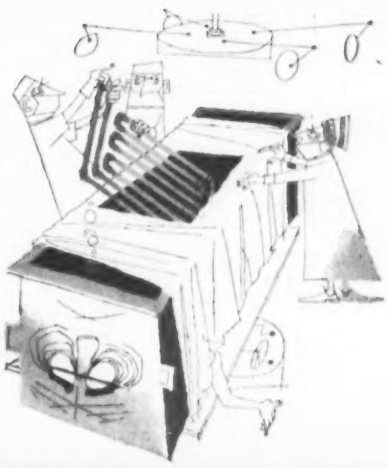
Philadelphia — Carbon bars are freely available in any shape or size. Until recently most mills fought shy of certain special items, but today this business is welcome. Some slight improvement is noted in demand from the automotive industry. In scattered instances, inventory replacements are being made. But the railroads and railroad equipment builders are specifying relatively little, and until carloadings increase they are not likely to show much interest. Machine tool requirements are slow; shell work is light.

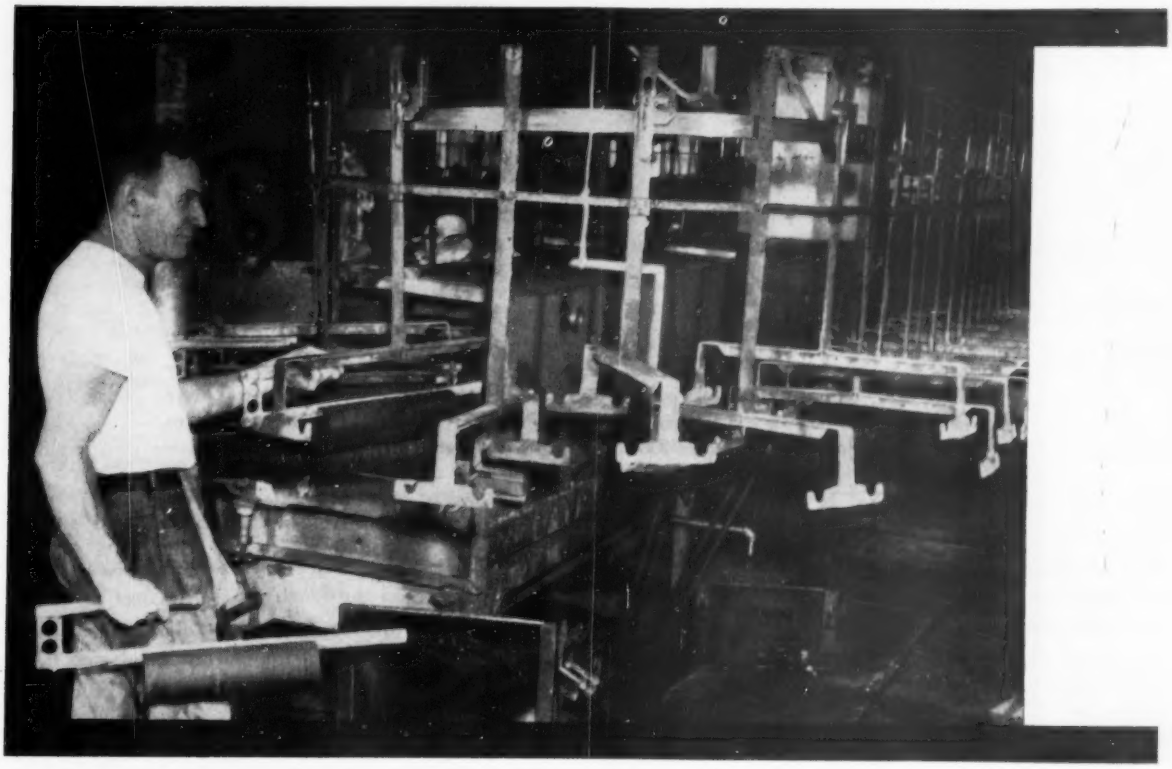
Pittsburgh—Cold-finished bars are undergoing an area-wide slowdown. Sales to warehouses and automakers have been slow since December. Some

coil-itis* cured — chipping eliminated by PLATECOILS to save 6 to 8 hours daily

Use of Stainless Steel Platecoils in a phosphate coating tank at Sealed Power Corporation has completely eliminated a 6 to 8 hour a day chipping job. The brass pipe coils formerly used became so coated with scale they had to be cleaned daily.

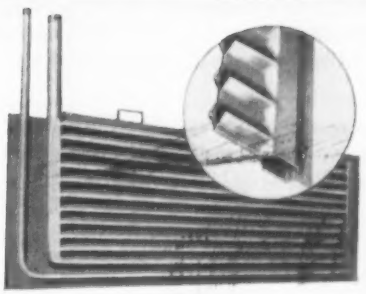
Three Platecoils heat this tank as efficiently as four pipe coils and maintain desired temperatures throughout both shifts. Scale removal, when necessary, takes less than two manhours compared to 10 hours for pipe coils.



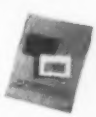


PLATECOILS replace pipe coils for 50% of the cost

* Coil-itis is the constant doctoring of wet processing tanks for pipe coil troubles. It can be cured easily by replacing pipe coils with Platecoils. Immediately, you will notice the difference as Platecoils put new life and profits into your heat transfer processes. They heat or cool 50% faster and take 50% less space in the tank. They save as much as 50% in initial cost and 50% in maintenance costs in addition to overcoming the limitations and operating difficulties of old fashioned and outmoded pipe coils.



Bulletin P72 shows how Platecoils are replacing pipe coils at a savings throughout industry. Send today for your copy.



Platecoil Division, TRANTER MANUFACTURING, inc., Lansing 4, Michigan

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HENRY FORD II

President, Ford Motor Company

"In the most practical way possible—the regular purchase of U.S. Savings Bonds—millions of Americans are demonstrating complete confidence in our form of government. Investors in democracy, they are freely staking their personal security on a fundamental faith in the future of our nation. I am proud that today more than 57,000 Ford Motor Company employees are participating in the Payroll Savings Plan. Last year they bought bonds worth $25,000,000 at face value, and this year the total of their purchases will be even greater. Through their thrift they are helping to keep America strong."

Few investment groups are as important to America as the members of the Ford Payroll Savings Plan. They are *important* in size—57,000 men and women... important in buying power—they actually purchase $25,000,000 in Savings Bonds every year... and *very* important to our economic stability—"through their thrift they are helping to keep America strong."

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STEEL
THE WEEKLY MAGAZINE OF METALWORKING

companies are beginning to feel effects of declining business. Most forward buying is for the late first quarter and April, showing possibility of improved orders at that time. On the brighter side, mills are better able to fill orders than at any time last year.

Cleveland—First quarter demand for bars, both carbon and alloy, is disappointing so far. While bookings for January are described as fair makers still are awaiting large February and March orders. Consumers are disposed to order cautiously with relatively prompt shipment tonnage open to them. Generally, the barmakers anticipate a substantial pickup in ordering as automotive lines step up activity. March, it is said, will likely be the best month during first quarter from the standpoint of volume.

Cincinnati—There has been little change in the market for steel bars. Supplies are adequate and sales slow.

Los Angeles—Fabricators' bar requirements are lighter. Adequate mill facilities in this district allow Bethlehem Pacific Coast Steel Corp. to adjust rolling schedules virtually to meet demand. Space on January books of this producer is still available. February books of Kaiser Steel Corp. are filled, with March books just opened.

Plates . . .

Plate Prices, Page 112

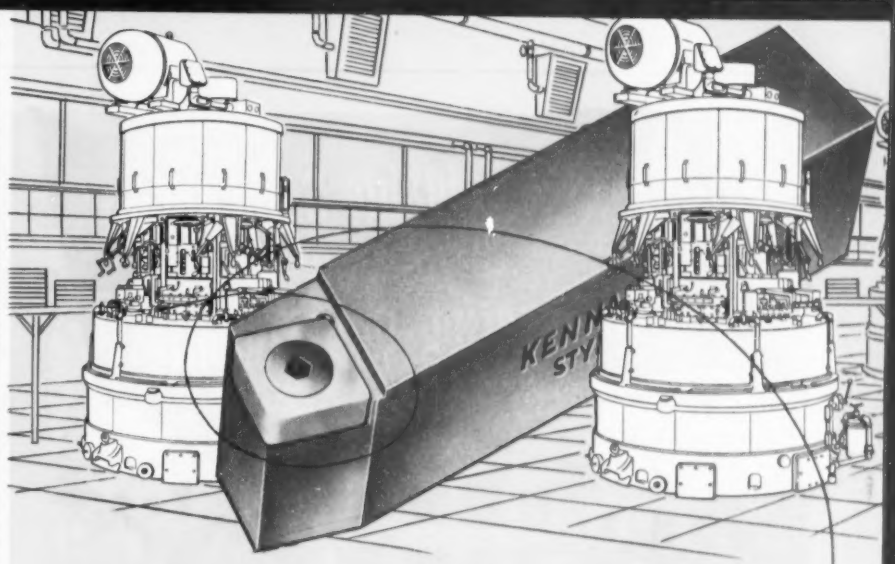
Philadelphia—Plate business still lags, with volume not up to what some producers expected it would be by this time. Actually, no one anticipated that it would be brisk, but the rebound from the holiday and inventory-taking period of late December has been disappointing. Even as of now some mills can accept tonnage for rolling this month, to say nothing of ability to accept heavy tonnage for February.

Boston—Forward orders for carbon plates are limited, fabricating shops being slow in placing February requirements. Most plate consumers have lower backlogs and are adjusting buying to shorter run schedules.

With openings in mill capacity for prompt shipment from eastern Pennsylvania, plate users are not inclined to build inventory beyond needs for specific requirements.

Small tank volume is enhanced by airfield fueling system estimates.

New York—Aside from recovering from the low level of the holidays, plate demand has shown little in the way of activity so far this month. Volume is described as fair, with re-



The Most Critical Point in AUTOMATION

Machine shop automation—the new trend toward automatic conveying, loading, cutting, unloading, and transferring of workpieces—promises great gains in productivity, but it must have cutting tools designed for the operation.

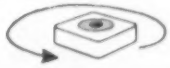
Two features are essential in cutting tools for automation: (1)Durability which enables operation to be sustained with minimum stoppage for tool changing, and, (2)precision-ground, pre-set, multiple-edge tools which permit quick changing when necessary.

Kendex "throw-away" inserts —an exclusive Kennametal development—have both features. Made of Kennametal, they have its high hardness and wear-resistant properties for great durability. Screw-mounted, they can be quickly rotated, in seconds, to new cutting positions. No grinding is required—the insert is thrown away after all cutting edges have been used and quickly replaced with a new preground "button" ... round, square, or triangular as required.

Our engineers, in on the ground floor of automation, have cooperated in developing and applying Kendex, Kennamatic,* and other types of Kennametal tooling to its requirements. The features of this tooling may be the solution to reducing machining and tool maintenance costs—on any operation—in your shop. Ask your Kennametal tool engineer how you may apply it to advantage. Kennametal Inc., Latrobe, Pa.

KENDEX* tooling keeps AUTOMATION IN ACTION!

1. Hard, strong, wear-resistant Kennametal is molded into square, round, or triangular Kendex inserts, which are precision ground.



2. Kendex inserts are mounted to suitable holder with socket head screws. When edge becomes dull, insert can be turned, in seconds, to new cutting position.

- *MINIMIZE* downtime for tool changing—a major cause of unprofitable operation.
- *ELIMINATE* tool grinding expense—Kendex inserts are not ground; simply thrown away when all cutting edges have been used.

*Registered Trade-Marks

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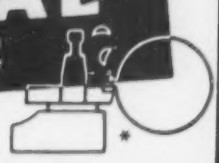

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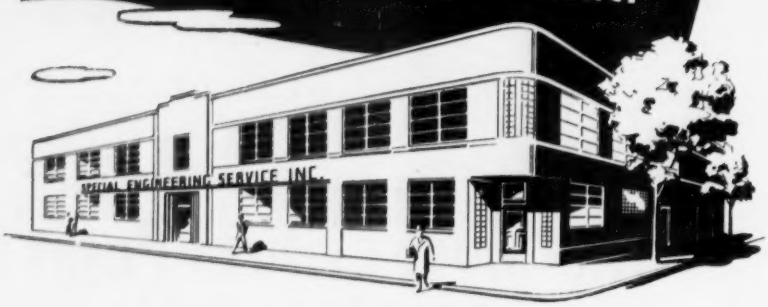

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Our company's stability, along with a progressive profit sharing plan, has attracted a large staff of versatile engineers who have skill and practical experience in both tool design and application, as well as in modern production methods. Our constant aim is close cooperation with your personnel. The result we seek is to help them develop the product, tooling method or production operation which will turn the most profit for you. Also of value to you is our reputation for prompt service. In fact, our company plane will fly staff members right to your plant for consultation *within hours after you request it!*

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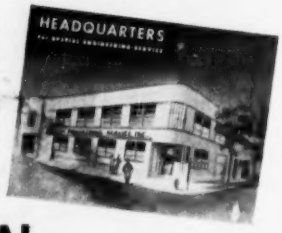

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WITH METHODS AND DESIGN

quirements in no sense pressing facilities. Some mills can work in a little tonnage for January. As for February, plenty of capacity is available.

Producers are more optimistic over the long range outlook than they are over the nearby picture. By late February, or early March, demand should be moderately brisk, they believe.

Pittsburgh—A slight seasonal dip in construction has made light and heavy plate easier to obtain. Mill quotas are generally no longer in force, and fabricators can secure all plate they need. Demand from users, except freight car builders, continues strong. Mills don't expect to begin freight absorption in the near future.

Seattle—Business is slow with smaller plate fabricating plants. Plates are in adequate supply. The larger oil companies in this area plan expansions involving considerable plate tonnage.

Structural Shapes . . .

Structural Shape Prices, Page 112

New York—Shipments of fabricated structural steel are expected to be smaller this year than in 1953. Preliminary reports of the American Institute of Steel Construction show shipments last year were 3,100,000 tons, up 436,000 from the total 1952 movement. Volume, dollarwise, was a record-breaking $35 billion during the year.

Predictions for 1954 contemplate the year as likely to be second only to 1953. Over-all construction, it is said, will decline no more than 2 to 3 per cent from that reported for 1953.

Utility construction will be greater, perhaps as much as 3 per cent. Highway construction is expected to increase 10 per cent. Privately financed non-residential building is seen declining about 2 per cent, and public financed non-residential building 1 per cent. Greatest decline is expected in government and military construction, as much as 10 per cent.

Types of construction expected to increase during 1954 are those which use heavy structural shapes. With greater availability of structurals, much construction will be planned for steel that otherwise would use other materials.

New York — Considering the season, structural market activity is holding up fairly well. Contracts are spotty, but a substantial volume of work is reported under negotiation. Fabricators anticipate a satisfactory first quarter. Outstanding

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Applying tool and die steels for best results *is* a science . . . and even "old hands" in the business sometimes run into problems. Have you ever wondered where you can go to ease your own headaches and worries in this respect . . . what you can do to keep your tools and dies on a more dependable production schedule?

When you contact your Carpenter Mill-Branch Warehouse, Office or Distributor, you're calling for a profitable answer to these questions. The quality of Carpenter steels, plus Carpenter's comprehensive service program, go all out to help you get more dependable results on every job.

Regardless of who made the tool or die steel you're using . . . if you're seeking improved tool and die results—"tired" of sweating out problems alone—a Carpenter Representative stands ready to join your team now. His experience on tooling, heat treating and trouble-shooting means tangible benefits for you.

And here's additional help, too. A call to your Carpenter Mill-Branch Warehouse, Office or Distributor can bring fast information on prices, sizes and grades of Carpenter tool, alloy and stainless steels. You get a direct line to printed service literature that you'll find helpful day after day. And if necessary, Metallurgical Counsel is available from the Reading Mill.

If you believe that all steel warehouse services leave something to be desired, we offer you this challenge: Call your Carpenter Mill-Branch Warehouse, Office or Distributor and see if it doesn't lead to a profitable difference in your own plant setup. The Carpenter Steel Co., 139 West Bern St., Reading, Pa.

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award currently is 3495 tons for a Jamaica Bay crossing for the New York City Transit Authority.

Boston—Bridge tonnage is likely to exceed that of last year, bolstering shop activity in second and third quarters. Connecticut has placed 2000 tons, including truss spans over the Housatonic river. To meet shop schedules, better balance in procurement of plain structural material is assured. Some improvement in wide flange beam supplies is expected shortly.

Philadelphia—Bridge work features structural activity, but there is less bridge inquiry so far this year than anticipated. The market as a whole is quiet. Most fabricators have comfortable backlogs and are still confident that good business lies ahead, especially as the spring season approaches. Meanwhile, fabricators report steel inventories as being in best shape in several years.

Pittsburgh—Producers are ironing out supply difficulties which are making wide flange beams very tight. No seasonal slump is appearing in sales, although standard structural shapes are in fairly good supply. Contributing to bright predictions for this year, the state highway department of Pennsylvania is planning a multi-million dollar construction program in the Pittsburgh area.

Los Angeles—Value of construction in Los Angeles county exceeded $1,040,000,000 last year, highest in history. Wide-flange beams are reported in more plentiful supply.

San Francisco—Marking the first deep foundation to rock ever undertaken in San Francisco, 3300 tons of steel piling, welded together in lengths of from 100 to 130 feet, are being driven into the ground here for the 22-story office building of Equitable Life Assurance Society of the United States. There will be 5200 tons of above-ground structural steel used.

Seattle — Two sizable structural awards are pending, 2400 tons for Bonneville tower steel, and 2000 tons for the The Dalles dam project, Columbia river, bids in. Bethlehem Pacific Coast Steel Corp., Seattle, will furnish 400 tons for an addition to the Scott Paper Co. plant, Everett, Wash.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 112

Boston—Backlogs of concrete steel bar distributors are smaller with one or two exceptions. The latter have built up bookings through price concessions, including the waiving of some extras. Bulk of pending bridge requirements has been closed with less tonnage being estimated. Housing inquiry is down.

Seattle—Demand for bar mill products is seasonally normal. Backlogs are low but prospects are promising for first quarter. Small jobs are fairly numerous, aggregating considerable tonnage.

Tin Plate . . .

Tin Plate Prices, Page 114

Chicago—End of strikes in can-making plants is hailed by tin plate makers for it will solve a warehousing problem. Production has held fairly steady with can companies retaining original commitments. In some cases mills were obliged to arrange for storage space outside their plants.

Birmingham, Ala.—Tennessee Coal & Iron Division, U. S. Steel Corp., has placed substantially all of the contracts pertaining to installation of a third electrolytic tinning line at its Fairfield mill.

Ferroalloys . . .

Ferroalloy Prices, Page 132

Pittsburgh—U. S. Steel Corp. has reduced output of ferromanganese by removing its No. 3 blast furnace at the Clairton Works from production. The furnace has daily capacity for 247 tons. Stocks of ferromanganese are reported ample at present.

Pig Iron . . .

Pig Iron Prices, Page 116

Cleveland—Some improvement in gray iron castings demand is noted, especially among shops on a general line of work. Further gains are expected as the first quarter advances. In general, foundry operations are spotty, but many shops are operating 4 and 5 days per week.

As a result of the pickup in foundry melt since the closing weeks of last year, merchant iron is moving in somewhat better volume.

Boston—Melters of all grades of pig iron have no worry as to supply. Contrary to old time practice, few users of foundry grades have built up inventory for winter and in some cases delivery, due to weather conditons, temporarily is a factory melt. Foundry operations started to sag more than six months ago and have not recovered.

New York—Most pig iron sellers note little change in market condi-

(*Please Turn to Page* 135)

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When this well-known stove manufacturer wanted to speed up assembly, he put his problem to "Reading" engineers. Installation of a 10-ton, double I-beam, cab-controlled "Reading" crane brought even greater results than expected. There are good reasons.

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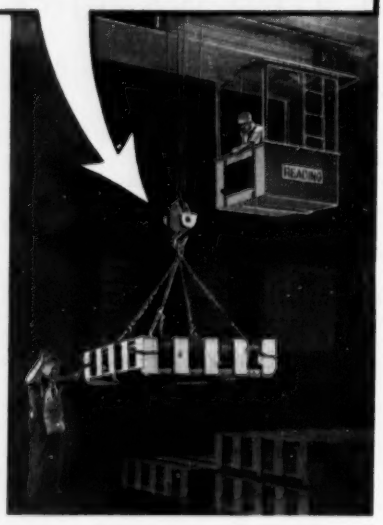

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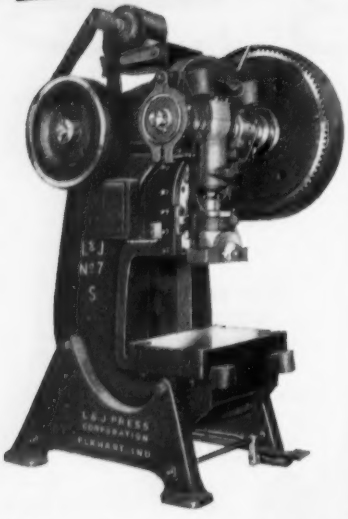

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Prices as reported to STEEL; changes shown in italics.

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Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%	22.00
North African hematite (spot)	20.00-22.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, before duty

Foreign Wolframite, min. 60%, WO_3	23.80
Domestic scheelite, mine	63.00

Manganese Ore

Mn, 48% nearby, $1.12 per long ton unit, c.i.f. U. S. ports, duty for buyers' account; 46-47%, $1.05-$1.07.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.:

Indian and African	
48% 2.8:1	$40.00-$42.00
48% 3:1	44.00-46.00
48% no ratio	32.00-34.00
South African Transvaal	
44% no ratio	$24.00-$26.00
48% no ratio	34.00
Domestic (Rail nearest seller)	
48% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb, Mb content, mines, unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

50-60%	$2.40-$2.80
65% min.	$3.40-$3.50

Vanadium Ore

Cents per lb. V_2O_5 content, deld. mills

Domestic	31.00

REFRACTORIES

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $109; Salina, Pa., $114; Niles, O., $120; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $115; Warren, O., Hays, Pa., $120; Niles, O., $120; E. Chicago, Ind., Joliet, Rockdale, Ill., $125; Cutler, Utah, $116.55; Los Angeles, $122.85.

Insulating Fire Brick

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Athens, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $77.50; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Perla, Ark., $109; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $139.70; Johnstown, Pa., $140; Clearfield, Pa., $148.50; St. Louis, $151.80; Athens, Tex., $155.

Nozzles

Reesdale, Pa., $223.50; Johnstown, Pa., $229.20; Clearfield, Pa., $241.40; St. Louis, $247.10; Athens, Tex., $247.70.

Runners

Reesdale, Pa., $174; Johnstown, Pa., $177.80; Clearfield, Pa., $185.50; St. Louis, $187.30; Athens, Tex., $191.80.

High-Alumina Brick

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $179; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $223.00; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $225; Danville, Ill., $258; Clearfield, Pa., $252.

Dolomite

Domestic, dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Nario, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $14.60, Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite

Domestic, deadburned bulk; Luning, Nev., $38.

METALLURGICAL COKE

Price per net ton

Beehive Ovens	
Connellsville, furnace	$14.50-15.00
Connellsville, foundry	16.50-17.00
Oven Foundry Coke	
Kearney, N. J. ovens	$24.00
Everett, Mass., ovens	
New England, deld.	*26.00
Chicago ovens	24.50
Chicago, deld.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, deld.	28.12
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	23.95
Swedeland, Pa., ovens	23.85
St. Louis, ovens	
St. Louis deld.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, deld.	26.62
Detroit, ovens	25.50
Detroit, deld	26.50
Buffalo, deld.	28.08
Flint, deld.	28.23
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	40.00
Toluol, one deg.	30.00-33.00
Industrial xylol	30.00-33.50

Per ton, bulk, ovens

Sulphate of ammonia	$44-45
Birmingham area	$49.50

Cents per pound, producing point

Phenol, 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

FLUORSPAR

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $44; 70%, $42.50; 60%, $38. Imported, net ton, duty paid, metallurgical grade, $35-$36.

ELECTRODES

(Threaded with nipple, unboxed f.o.b. plant)

Inches Diam.	Length	Per 100 lb
GRAPHITE		
2	24	$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5½	40	25.75
6	60	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18	72	20.50
20	72	20.00
CARBON		
40	100	$8.95
40, 35, 30	110	8.95
30	84	9.10
24	96	8.90
24	72, 84	9.10
20	90	8.95
20	84	9.10
17	72	9.10
17	60	9.50
14	72	9.50
14, 12, 10	60	10.30
8	60	10.55

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CURRENT FERROALLOY QUOTATIONS

Prices as reported to STEEL

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si), Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.
(16 to 19% Mn) $84 per ton, Palmerton, Pa; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $200, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; and Portland, Oreg.; add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $208 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max, 0.15% C grade from above prices, 1c for max, 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Electromanganese: Carload, 31.5c; ton lots 33.5c; 250 to 1999 lb, 35.5c. Premium for hydrogen-removed metal, 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.4c per lb of alloy, carload packed, 12.15c, ton lots 13.05c, less ton 14.00c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%.) Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%) Contract, carload, lump, bulk, max. 0.025% C (Simplex) 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%) Contract, c.l. S M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, S M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 25.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 25.90c per pound of contained chromium plus 12.60c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr, 36-39%, Si 26-39%, Al 7-9%, C 0.05% max). 25.75c per lb of contained chrome plus 12.4c per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: (Min 97% Cr and 1% Fe) contract, 1" x D; packed, max 0.50%, carload $1.12, ton lots $1.14; less ton $1.16. Delivered. Spot, add 5c Prices on 0.10 per cent carbon grade, add 4c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max). $3.10. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contact, carload, lump bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min 97% Si and 1% max Fe) C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max, 010% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 20 to 1999 lb 11.65c, smaller lots 12.15c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y. freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c ton lot 22.3c, less ton 23.3c. Delivered, Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c, Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.65c, per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet. Packed c.l. 7.75c, ton lot 8.85c, less ton 9.45c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c. Packed c.l. 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 10,000 lb W or more, $4.10 per lb of contained W; 2000 lb W to 10,000 lb W, $4.20; less than 2000 lb W, $4.32, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max. C 0.4% max.). Contract, ton lot, 2" x D, $6.40 per lb of contained Cb, less ton $6.45. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $4.75 per lb of contained Cb plus Ta, deld.; less ton lots $4.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%), Carload packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr. 5-7%, Fe 20% approx). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy; ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 14.50c. Packed c.l. 15.50c, ton lots, 15.75c, less ton lots, 16.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb, contained Mo, f.o.b. Langeloth, Pa., $1.14 in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

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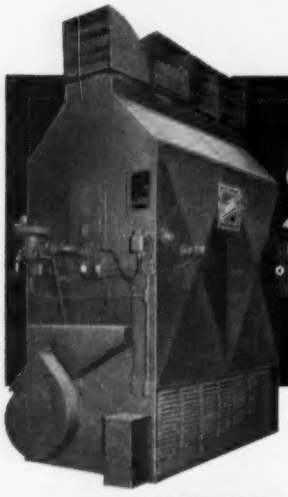

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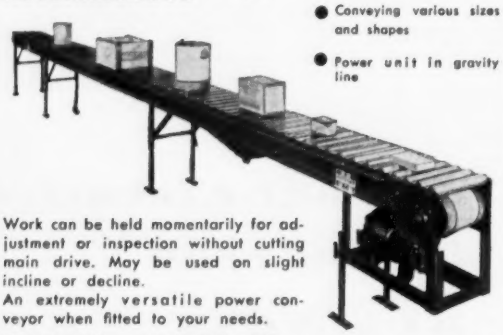

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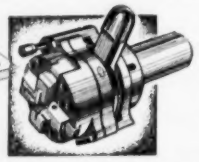

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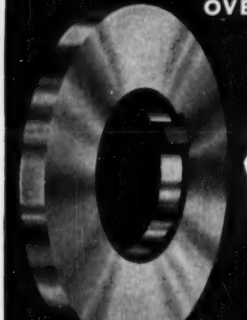

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Pig Iron . . .

(*Concluded From Page* 128)

tions from those prevailing prior to the holidays. There has been some recovery from the yearend dip, but no particular improvement beyond that. Not much change, one way or the other, is expected the next few weeks.

Philadelphia—While the movement of pig iron has improved, the month as a whole will show only a modest gain over December. Most foundries continue to operate on a limited basis—possibly a little more than four days a week on an average. Prospects are that this schedule will not show much improvement for the time being. Consumer inventories are not as high as they were several weeks ago.

Buffalo—Mixed tendencies prevail in the merchant pig iron market but production of iron holds at 88 per cent of capacity.

Pittsburgh—No. 4 blast furnace at U. S. Steel Corp.'s Rankin, Pa. Works closed Jan. 11 and will be down for about two weeks. The No. 7 stack at Edgar Thomson Works returned to production Jan. 9. It had been banked Dec. 8.

Cincinnati—One of the big questions in the merchant pig iron market is how far apart scrap and pig iron prices will range before a price adjustment comes in the latter. Foundry work is lagging.

Chicago—Orders and shipments of pig iron will exceed December volume although the total is well below that of third quarter last year. Few foundries have much in the way of order backlogs but inventories of raw materials, in some cases, were allowed to drop lower than is deemed safe.

St. Louis—Production of pig iron in this district has dropped to half of capacity, with one blast furnace down for a 90-day relining job.

Los Angeles—Blast furnace No. 1 at Kaiser Steel Corp.'s Fontana Works is down for relining. Operation of the mill's 8 open-hearth furnaces will not be affected for lack of hot metal, however. Inventories of pig iron and scrap along with the output of the two remaining active blast furnaces are sufficient to support steel production.

Seattle—Domestic pig iron is available in sufficient quantities to stock foundries in this area. Some Australian iron, which sells here at about $10 under domestic pig, is enroute. Other foreign iron, however, cannot compete with American grades and no business has been closed here for months.

European and South African quotations are not available but it is reported delivered prices from those markets would be $10 per ton above the domestic quotation. Indian iron also is out of competition here.

Iron Ore . . .

Iron Ore Prices, Page 130

Cleveland — New all-time record movement of dry bulk freight was set by the Great Lakes fleet in the 1953 season. Total shipments fell just short of 200 million net tons.

In addition to establishing a new iron ore tonnage record, the fleet moved 26,999,207 net tons of limestone, a new high mark.

Ore movement of 95,844,449 gross tons marked the second year in history in which shipments exceeded 90 million tons. The year also saw new monthly records established in May, June, July and August.

Shipments of the four major bulk commodities, iron ore, coal, grain and limestone, reached a total of 199,694,820 net tons, compared with the previous record of 189,750,172 tons, set in 1951, and 168,677,006 tons moved in 1952.

Bituminous coal shipments amounted to 50,750,990 net tons, largest volume since 1950, and 5 million tons greater than in 1952. On the other hand, anthracite cargoes, aggregating 281,611 net tons, were 50 per cent down from the previous year and the lowest since reliable statistics were first compiled in 1911.

Grain shipments totaled 546,928,447 bushels, and with the exception of 1952, were the largest for any season since the record year 1945. Canadian ships hauled 73 per cent of all grain shipped on the lakes.

Figures are not yet available on 1953 shipments of petroleum and its derivatives, but they are expected to approach 1952's record movement of 17,448,490 net tons.

The record performance in the 1953 shipping season was made possible by the addition of nine new ships to the fleet during the year, as well as unusually good sailing weather throughout the season.

New York—The first cargo of iron ore, 6000 tons, from U. S. Steel Corp.'s Cerro Bolivar mines in Venezuela is scheduled to arrive at the Fairless Works, Fairless, Pa., Jan. 20. It will arrive in the Swedish ship, *Tosca*, following a trip of 2004 nautical miles from Puerto Ordaz, from which the vessel sailed Jan. 9. *Tosca* is scheduled to dock Jan.

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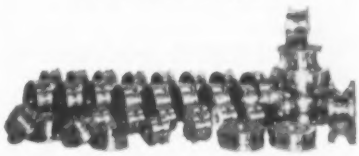

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19 at Philadelphia for ceremonies which will be attended by the Venezuelan ambassador to this country, Dr. Cesar Gonzales, U. S. Steel officials, headed by Board Chairman Benjamin Fairless and President Clifford F. Hood, and representatives of the Philadelphia Port Authority.

To navigate the Delaware river above Philadelphia, *Tosca* was loaded to draw no more than 21 feet of water.

Some 3 million tons of ore are expected to be shipped from the corporation's Venezuelan property to Fairless and Mobile, Ala., this year, and 5 million tons in 1955. Eventually, annual shipments may reach 10 million tons.

Tosca is operated by the Hendy International Corp., subsidiary of the Joshua Hendy Iron Works, San Francisco.

Scrap . . .

Scrap Prices, Page 138

Pittsburgh — Uncertainty about steel operations this year is restricting scrap purchases to replenishment of stocks. No major sales have been made in two weeks. The market is quiet with slight declines noted in blast furnace grades. Railroad scrap prices were off moderately last week.

Philadelphia — Prices on open-hearth scrap have undergone a further decline on the basis of light buying, confined principally to one mill. Despite the first real touch of winter recently, indications point to no immediate pick-up in demand. Under present weather conditions, collections of material should be more difficult, but most buyers have substantial inventories on hand and stocks at dealers' yards generally are substantial.

No. 1 heavy melting steel, No. 1 bundles and No. 1 busheling are now $28, delivered consumer plant. No. 2 heavy melting steel is off $2 at $25 and No. 2 bundles is down to $23. Electric furnace bundles are a shade easier at $30. No change is noted in machine shop turnings, mixed borings and turnings, short shovel turnings or rail crops.

Cast grades also are steady, No. 1 cupola holding at $33-$35, delivered, and heavy breakable cast at $36-$37.

Low phos structural and plate are steady at $32, delivered, and couplers, springs and wheels at $35-$36. Through a typographical error both of these classification were reported off by $10 a ton in last week's issue.

Boston—Yard intake of steel scrap is off, but in some instances supplies of prepared material are substantial. Dealers are reluctant to sell at the low prices prevailing over recent weeks. Consumers, with operating rates down, are not pressing for additional tonnage, but shipments against old contracts are reported steady.

New York—Brokers have again reduced buying prices on open-hearth grades of scrap. They are now offering $20 for No. 1 heavy melting and No. 2 bundles, $17 for No. 2 heavy melting and $15 for No. 2 bundles. There is little consuming demand and little in early prospect. Brokers' buying prices on low phos structurals, plate, borings and turnings, and cast scrap are unchanged.

Buffalo—Scrap market sentiment is bolstered slightly by a small sale of No. 1 heavy melting steel within the prevailing price range. Buying interest remains negligible as all three leading mill consumers remain out out the market.

Cleveland—The scrap market, for the most part, is marking time. Some small-lot buying is reported,

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both here and in the Valley, but the market is devoid of spirited activity. A small tonnage was reported taken by a local mill at prices recently prevailing. Two Valley buyers also are reported to be taking small lots.

Meanwhile, prices are steady, both on steelmaking and foundry grades. Some further easing in the railroad grades is reported, however. Foundries are taking a little more cast tonnage with their operations up somewhat from the yearend low point.

Detroit—Sales continue extremely slow in the Detroit area with increased activity noted in some cast grades as foundries get going on dies for 1955 models.

Price changes this week include: No. 2 bundles quoted higher at $18.50; short shovel turnings, $12; clean auto cast, $40; malleable off at $30 on the basis of a sale.

Cincinnati—Low phos scrap, based on actual sales, is off $4 a ton below the previous level. Some other grades have been brought in line with trends in other markets.

Chicago—Light buying of steelmaking grades of scrap has held prices at the levels prevailing a week ago and put them in nominal category. Exception is another drop of $1 per ton on rerolling rails to $39. Steel mill operating rate in this district has settled an additional 3 points and scrap inventories are sizable. Both are factors in the weak market. Blast furnace grades and cast material are in slow demand.

St. Louis—Scrap continues in slow demand with prices soft as mills hold out of the market. Rerolling rails have drifted $2 per ton lower under the burden of recent or impending offerings by the Missouri Pacific, the Southern, the Cotton Belt and the Great Northern railroads.

Los Angeles—All district mills are completely out of the scrap market for January, and possibly February. Prices are the lowest since 1940, and a further reduction of 30 per cent is likely. With inventories rising to historic peaks, West Coast scrap dealers are agitated over obstacles to the free export of scrap to Japan placed in their path by the Japanese cartel.

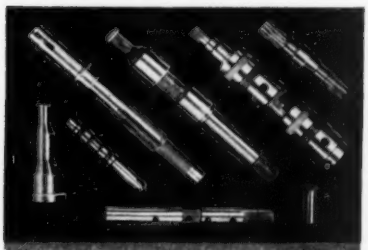
San Francisco—Steel scrap buying continues at low ebb. Despite the slow movement, prices are steady. Cast grades are moving more freely.

Seattle—Larger scrap buyers reentered the market last week but prices held unchanged at $27 for No. 1 heavy melting, delivered, $23 for No. 2, delivered, and $19 for No. 2 bundles.

Dealers are well stocked and supplies are ample for current needs. There is no surplus of No. 1 material, however.

Toronto, Ont.—With demand at a virtual standstill, Canadian scrap iron and steel prices have been severely slashed as material piles up in dealers' yards.

New price lists and reclassification of some grades feature the market at present. Both No. 1 heavy melting and No. 1 bundles are new classi-



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Consumer prices, per gross ton, except as otherwise noted, including broker's commision, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Jan. 14	$29.17
Jan. 7	29.67
Dec. Avg.	32.10
Jan. 1953	43.00
Jan. 1949	41.54

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting	30.00-31.00
No. 2 heavy melting	27.00-28.00
No. 1 bundles	30.00-31.00
No. 2 bundles	25.00-26.00
No. 1 busheling	30.00-31.00
Machine shop turnings	*17.00-18.00*
Mixed borings, turnings	*18.00-19.00*
Short shovel turnings	20.00-21.00
Cast iron borings	20.00-21.00
Cut structurals	36.00-37.00
Heavy turnings	30.00-31.00
Punchings & plate scrap	34.00-35.00
Electric furnace bundles	31.00-37.00

Cast Iron Grades

No. 1 cupola	*35.00-36.00*
Charging box cast	*34.00-35.00*
Heavy breakable cast	32.00-33.00
Unstripped motor blocks	24.00-25.00
No. 1 machinery cast	44.00-45.00

Railroad Scrap

No. 1 R.R. heavy melt.	33.00-34.00
Rails, 2-ft. and under	46.00-47.00
Rails, 18-in. and under	47.00-48.00
Rails, random lengths	39.00-40.00
Railroad specialties	*36.00-37.00*

Stainless Steel Scrap
(F.o.b. shipping point)

18-8 bundles & solids	165.00-170.00
18-8 turnings	85.00-90.00
430 bundles & solids	85.00-87.00
430 turnings	60.00-62.00

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting	28.00-29.00
No. 2 heavy melting	24.00-25.00
No. 1 bundles	28.00-29.00
No. 2 bundles	23.00-24.00
No. 1 busheling	28.00-29.00
Machine shop turnings	14.00-15.00
Mixed borings, turnings	18.00-19.00
Short shovel turnings	18.00-19.00
Cast iron borings	18.00-19.00
Low phos.	30.00-31.00
Alloy free, short shovel turnings	21.00-22.00
Electric furnace bundles	30.00-31.00

Cast Iron Grades

No. 1 cupola	41.00-42.00
Charging box cast	29.00-30.00
Stove plate	36.00-37.00
Heavy breakable cast	25.00-26.00
Unstripped motor blocks	24.00-25.00
Brake shoes	33.00-34.00
Clean auto cast	43.00-44.00
No. 1 wheels	39.00-40.00
Burnt cast	30.50-31.50
Drop broken machinery	*42.00-43.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*30.00-31.00*
R.R. malleable	42.00-43.00
Rails, 3-ft. and under	43.00-44.00
Rails, 18 in. and under	45.00-46.00
Rails, random lengths	38.00-39.00
Cast steel	35.00-36.00
Railroad specialties	35.00-36.00
Uncut tires	37.00-38.00
Angles, splice bars	41.00-42.00
Rails, rerolling	42.00-43.00

Stainless Steel
(F.o.b. shipping point)

18-8 bundles, solids	nom. 160.00-170.00
18-8 turnings	nom. 70.00-80.00
430 clips, bundles, solids	nom. 70.00
430 turnings	nom. 50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	29.00-30.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	29.00-30.00
No. 2 bundles	27.00-28.00
Machine shop turnings	15.00-16.00
Short shovel turnings	20.00-21.00
Cast iron borings	20.00-21.00
Low phos.	31.00-32.00
Electric furnace bundles	31.00-32.00

Railroad Scrap

No. 1 R.R. heavy melt.	31.00-32.00

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting	*28.00*
No. 2 heavy melting	*25.00*
No. 1 bundles	*28.00*
No. 2 bundles	*23.00*
No. 1 busheling	*28.00*
Electric furnace bundles	*30.00*
Machine shop turnings	17.00-18.00
Mixed borings, turnings	19.00-20.00
Short shovel turnings	23.00
Structurals & plate	32.00
Heavy turnings	27.00
Couplers, springs, wheels	35.00-36.00
Rail crops, 2 ft & under	42.00

Cast Iron Grades

No. 1 cupola	33.00-35.00
Heavy breakable cast	36.00-37.00
Unstripped motor blocks	28.00
Drop broken machinery	40.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*20.00*
No. 2 heavy melting	*17.00*
No. 1 bundles	*20.00*
No. 2 bundles	*15.00*
Machine shop turnings	9.00-10.00
Mixed borings, short turnings	12.00-13.00
Low phos. (structural & plate)	26.00-27.00
Short shovel turnings	13.00-14.00

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unstripped motor blocks	21.00-22.00

Stainless Steel

18-8 sheets, clips, solids	160.00-165.00
18-8 borings, turnings	85.00-90.00
430 sheets, clips, solids	75.00-80.00
410 sheets, clips, solids	65.00-70.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	19.50-20.50
No. 2 heavy melting	15.50-16.50
No. 1 bundles	19.50-20.50
No. 2 bundles	16.00-17.00
Machine shop turnings	8.50-9.00
Mixed borings, turnings	9.00-9.50
xShort shovel turnings	12.00-13.00
No. 1 cast	29.00-30.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast	36.00-37.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	26.00-27.00
No. 2 heavy melting	23.00-24.00
No. 1 bundles	26.00-27.00
No. 2 bundles	20.00-21.00
No. 1 busheling	26.00-27.00
Machine shop turnings	*11.00-12.00*
Mixed borings, turnings	*14.00-15.00*
Short shovel turnings	*14.00-15.00*
Cast iron borings	*14.00-15.00*
Low phos., 18-in.	*34.00-35.00*

Cast Iron Grades

No. 1 cupola	37.00
Heavy breakable cast	34.00
Charging box cast	34.00
Drop broken machinery	44.00

Railroad Scrap

No. 1 R.R., heavy melt.	*28.00-29.00*
Malleable	*35.00-36.00*
Rails, 18-in. and under	44.00-45.00
Rails, random lengths	36.00-37.00

CHICAGO

No. 1 heavy melting	28.00-30.00
No. 2 heavy melting	23.00-24.00
No. 1 factory bundles	31.00-32.00
No. 1 dealer bundles	27.00-28.00
No. 2 bundles	21.00-23.00
No. 1 busheling	28.00-30.00
Machine shop turnings	11.00-12.00
Mixed borings, turnings	11.00-12.00
Short shovel turnings	13.00-14.00
Cast iron borings	13.00-14.00
Cut structurals, 3-ft	32.00-33.00
Punchings & plate scrap	33.00-34.00
Electric furnace bundles	33.00-34.00

Cast Iron Grades

No. 1 cupola	32.00-33.00
Stove plate	26.00-27.00
Unstripped motor blocks	19.00-20.00
Clean auto cast	36.00-37.00
Drop broken machinery	36.00-37.00

Railroad Scrap

No. 1 R.R. heavy melt.	32.00-33.00
R.R. malleable	39.00-40.00
Rails, 2-ft. and under	43.00-44.00
Rails, 18-in. and under	44.00-45.00
Angles, splice bars	38.00-39.00
Rails, rerolling	*37.00-39.00*

Stainless Steel Scrap

18-8 clips & solids	*130.00-140.00*
18-8 turnings	*60.00*
430 clips & solids	*52.50*
430 turnings	*nom. 25.00*

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	23.00
No. 2 heavy melting	18.50
No. 1 bundles	23.00
No. 2 bundles	*18.50*
No. 1 busheling	23.00
Machine shop turnings	10.00
Mied borings, turnings	10.00
Short shovel turnings	*12.00*
Punchings & plate scrap	24.00

Cast Iron Grades

No. 1 cupola	35.00
Charging box cast	25.00
Stove plate	28.00
Heavy breakable	25.00
Unstripped motor blocks	18.00
Clean auto cast	*40.00*
Malleable	*30.00*

BUFFALO

No. 1 heavy melting	27.00-28.00
No. 2 heavy melting	24.00-24.50
No. 1 bundles	27.00-28.00
No. 2 bundles	22.00-22.50
No. 1 busheling	27.00-28.00
Machine shop turnings	14.50-15.50
Mixed borings, turnings	16.50-17.00
Short shovel turnings	17.50-18.00
Cast iron borings	16.50-17.00
Low phos.	31.00-32.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	30.00-31.00
No. 1 machinery	35.00-36.00

Railroad Scrap

Rails, random lengths	34.00-35.00
Rails, 2 ft and under	39.00-40.00
Railroad specialties	37.00-38.00

BIRMINGHAM

No. 1 heavy melting	26.00-26.50
No. 2 heavy melting	24.00-24.50
No. 1 bundles	26.00-26.50
No. 2 bundles	22.00-22.50
Cast iron borings	21.00-22.00
Short shovel turnings	20.50-21.50
Machine shop turnings	19.00
Cut structurals	nom.
Electric furnace bundles	nom.

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	41.00-42.50
Charging box cast	30.00-31.00
Stove plate	38.00-39.00
Bar crops and plate	38.00-39.00
Cut structurals	36.00-37.00
Heavy breakable cast	30.00-31.00
Unstripped motor blocks	34.00-35.00
No. 1 wheels	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	nom.
Rails, 2-ft. and under	42.00-43.00
Rails, random lengths	39.00-40.00
Angles, splice bars	38.00-39.00
Rails, rerolling	46.00-47.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	27.00
No. 2 heavy melting	25.00
No. 1 bundles	27.00
No. 2 bundles	22.00
Machine shop turnings	*12.00*
Short shovel turnings	12.00

Cast Iron Grades

No. 1 cupola	*37.00*
Charging box cast	27.00
Heavy breakable cast	27.00
Unstripped motor blocks	27.00
Brake shoes	36.00
Clean auto cast	*37.00*
Burnt cast	26.00

Railroad Scrap

No. 1 R.R. heavy melt.	31.00
Rails, 18-in and under	43.00
Rails, random lengths	36.00-37.00
Rails, rerolling	*38.00-39.00*
Uncut tires	30.00-31.00
Angles, splice bars	34.00-35.00

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting	27.00
No. 2 heavy melting	23.00
No. 1 bundles	24.00
No. 2 bundles	19.00
No. 3 bundles	15.00
Machine shop turnings	12.00
Mixed borings, turnings	12.00
Short shovel turnings	12.00
Electric furnace, No. 1	36.00-38.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	35.00-37.00
Heavy breakable cast	25.00-32.00
Unstripped motor blocks	23.00
No. 1 wheels	38.00-40.00
Stove plate	29.00

Railroad Scrap
(Delivered consumer plant)

Rails, random lengths	30.00-34.00

SAN FRANCISCO

No. 1 heavy melting	23.00
No. 2 heavy melting	19.00
No. 1 bundles	22.00
No. 2 bundles	19.00
No. 1 busheling	24.00
Machine shop turnings	7.00
Mixed borings, turnings	7.00
Short shovel turnings	11.00
Cast iron borings	11.00
Cut structurals	28.00
Heavy turnings	11.00
Punchings & plate scrap	28.00
Electric furnace bundles	22.00

Cast Iron Grades

No. 1 cupola	39.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	29.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	43.00

LOS ANGELES

No. 1 heavy melting	23.00
No. 2 heavy melting	19.00
No. 1 bundles	22.00
No. 2 bundles	19.00
Machine shop turnings	7.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	40.00-41.00

HAMILTON, ONT.

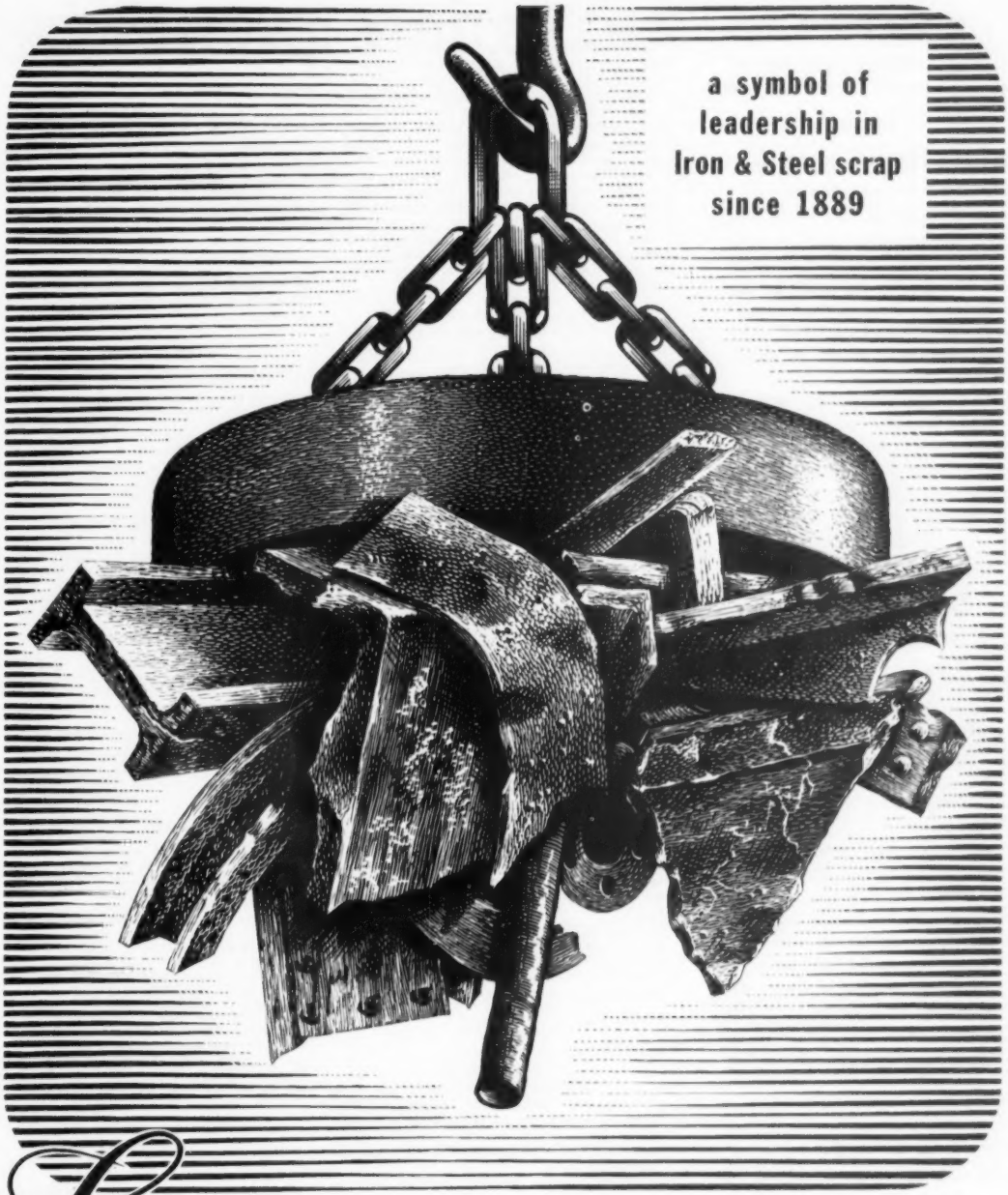
(Delivered prices)

No. 1 heavy melting	*$29.00*
No. 2 heavy melting	*26.00*
No. 1 bundles	*29.00*
No. 2 bundles	*26.00*
Mixed steel scrap	*23.00*
Mixed borings, turnings	*17.00*
Rails, remelting	*38.95*
Busheling new factory:	
Prepared	*27.00*
Unprepared	*23.00*
Short steel turnings	*17.00*

Cast Iron Grades†

No. 1 machinery cast	*43.00*

†F.o.b., shipping point.



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ERIE, PENNA.

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READING, PENNA.
ST. LOUIS, MO.
SAN FRANCISCO, CAL.

IMPORT & EXPORT DIV. LIVINGSTON & SOUTHARD, INC. 50 Broadway, New York, N. Y. *Cable Address:* FORENTRACO

fications and are of higher grade than formerly rated as No. 1 steel.

No. 2 heavy melting and bundles now are comparable to the former No. 1 classification.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 130

Chicago—Foundries will take in more coke in January than in December, partly due to fuller melting schedules and partly to building up of inventories. Feeling is that foundry operations now are at their bottom point and will move up gradually.

Cleveland—Oven coke is moving better with foundry operations up somewhat from the holiday low point. However, demand continues sluggish with consumers ordering largely for needs in sight, doing relatively little stockpiling. Despite the slow demand prices continue unchanged.

Rails, Cars . . .

Track Material Prices, Page 115

New York—Domestic freight car demand appears to be at a dead stop. No awards have been recently placed and none is in early prospect. Commercial car shops are feeling the squeeze in particular. Of the 2159 cars placed in December only 82 went to these shops.

Cars on order Jan. 1 totaled 29,950, according to the American Railway Car Institute and the Association of American Railroads. Of this total 16,567 were on the books of the commercial shops and 13,383 on those of the railroad shops. A year ago total backlogs amounted to 80,296 cars.

Deliveries of 4456 cars in December brought the total for the year up to 81,021.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

3495 tons, Jamaica Bay crossing, Transit Authority, New York city, to American Bridge Division, U. S. Steel Corp., Pittsburgh.

1250 tons, four-span truss bridge, Housatonic river, Brookfield-Bridgewater, Conn., to American Bridge Division, U. S. Steel Corp., Pittsburgh; Mariani Construction Co., New Haven, Conn., general contractor.

720 tons, W. T. Grant store, Philadelphia, to Belmont Iron Works, Eddystone, Pa.

695 tons, 4-story store and office building, Woolworth Co., Flushing, Long Island, through Webb & Knapp, general contractors, to Grand Iron Works, Bronx, N. Y.

400 tons, addition to Scott Paper Co. plant, Everett, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle.

360 tons, Wye construction, New York City Transit Authority, Hammels, Queens, through Horn Construction Co., to American Bridge Division, U. S. Steel Corp., Pittsburgh.

315 tons, junior high school, Bronx, New York city, through Caristo Construction Corp., to Dreier Structural Steel Co., Inc., Long Island city, N. Y.

255 tons, miscellaneous construction, Navy Yard, Brooklyn, through Carbetta Construction Co., to Bethlehem Steel Co., Bethlehem, Pa.

207 tons, school No. 191, Manhattan, New York city, through Caristo Construction Corp., general contractor, to Dreier Structural Steel Co. Inc., Long Island city, N. Y.

195 tons, addition, building No. 6, Carboloy Dept., General Electric Co., Detroit, through General Electric Realty Corp., to Ingalls Steel Construction Co., Birmingham, Ala.

135 tons, laboratory, General Electric Co., Cleveland, through General Electric Realty Corp., to Kilroy Structural Steel Co., Cleveland.

100 tons plus, intake gates and hoists, Dexter dam, Oregon, to Todd Shipyards Corp., Houston, Tex., low $42,400 to U. S. Engineer, Portland, Oreg.

STRUCTURAL STEEL PENDING

2800 tons, land section, east side of new Lincoln tube, New York Port Authority, New York city, bids Jan. 14.

2400 tons, tower steel; American Ligurian Co., Inc., New York, apparently low, $578,234 f.o.b. destination, to Bonneville Power Administration, Portland, Oreg.

500 tons or more, two 250-ton bridge cranes, one 655-ton unit, The Dalles dam; Carl B. Kraus Elevator Co., Chicago, apparently low for three schedules, $746,000, to U. S. Engineer, Portland, Oreg.

280 tons, bridge, Kennebec river, Embden-Solon, Me.; bids Jan. 18, State Highway Commission, Augusta, Me.

266 tons, state bridge work, Morris county, New Jersey, bids Jan. 26; also 120 tons of reinforcing steel.

200 tons, two radial gates, Palisades dam, Idaho; California Steel Products Co., Richmond, Calif., apparently low $65,900 to Bureau of Reclamation, Denver.

100 tons, wf beam bridge, Plymouth, Vt.; bids in to State Department of Highways.

REINFORCING BARS . . .

REINFORCING BARS PENDING

700 tons, Washington state office building, Olympia, Wash.; bids in.

250 tons, also unstated tonnage of corrugated pipe, Columbia Basin distribution system; bids about Jan. 20 by Bureau of Reclamation.

215 tons, 3-span deck plate girder bridge and steel stringer extension, Deerfield river, Buckland-Charlemont, Mass.; bids Jan. 26, Boston.

120 tons, state bridge work, Morris county, New Jersey, bids Jan. 26; also 266 tons of structural steel.

100 tons, state bridge work, Franklin county, Pennsylvania, bids Jan. 26; also 187 tons of structural steel.

PLATES . . .

PLATES PLACED

850 tons, stainless steel, including 250 tons for pipe, 6 underground disposal tanks, Hanford Works, to Thorn & Marble Plumbing & Heating Co., Seattle; Gaasland Construction Co., Bellingham, Wash., general contractor.

300 tons, aircraft fueling system, Presque Isle, Me., 15,000-barrel tank to Chicago Bridge & Iron Co., Chicago; 25,000-gallon tanks to Massachusetts Engineering Co., Inc., Boston; Consolidated Constructors, Inc., Portland, Me., general contractor.

160 tons, four propane tanks, Esso Standard Oil Co., Everett, Mass., to Bethlehem Steel Co., Bethlehem, Pa.

125 tons, elevated steel water tank, veterans' hospital, Coatesville, Pa., to Tippett & Wood, Phillipsburg, N. J.

PLATES PENDING

170 tons, 400,000-gal., 100-ft. elevated tank, veterans' hospital, Tuscaloosa, Ala.; bids Feb. 16, Veterans' Administration, Washington.

PIPE . . .

CAST IRON PIPE PLACED

100 tons, 12, 10 and 8-inch, Bremerton, Wash., to U. S. Pipe & Foundry Co., Seattle.

CAST IRON PIPE PENDING

125 tons, 6-inch, also unstated 18,000 feet of various sizes of steel pipe; also gates, etc.; bids to Vancouver, Wash., Jan. 25.

CLASSIFIED

Help Wanted

FOUNDRY METALLURGIST required with experience in cast iron foundry practice. Prepared to travel. State age, experience, and salary required. Reply Box 892, STEEL, Penton Building, Cleveland 13, Ohio.

WANTED a technologist experienced in cast iron and foundry practice. Prepared to travel. State salary required and full qualifications. Reply Box 893, STEEL, Penton Building, Cleveland 13, Ohio.

SALES AGENTS, on a commission basis, to represent Nationally known manufacturer of seamless and welded steel tubing and tubular parts, in the Syracuse, New York and St. Louis, Missouri areas. Prefer men with engineering or metallurgical background already established with other non-competing industrial accounts. State age, education, present business connections and military status. Information confidential. Reply Box 896, STEEL, Penton Building, Cleveland 13, Ohio.

WANTED, FULL TIME SALESMAN to contact industrial accounts in the New England states for Nationally known manufacturer of seamless and welded tubing, and forged and fabricated tubular parts. Some background in steel essential. Engineering or metallurgical training preferred. To work from established New York City office. Residence within commuting distance necessary. State age, education, business experience and military status. Information confidential. Reply Box 897, STEEL, Penton Building, Cleveland 13, Ohio.

SHOP SUPERINTENDENT
For plate and alloy fabrication company in Southern New England. This plant does all kinds of difficult fabrications out of steel plate, stainless steel, structurals, etc. Man must know layout, a good knowledge of welding and shop fabrication methods. Shop employs about twenty-five men. Give all necessary information in letter. All replies will be treated confidentially. Reply Box 900, STEEL, Penton Building, Cleveland 13, Ohio.

POSITIONS VACANT CLASSIFICATION
Structural Engineer and Detailer. Formal Education and Degree desirable but not required. 4 years' experience detailing absolutely essential. Shop and estimating experience helpful. Small shop in middle west doing light structural, miscellaneous and reinforcing. We are looking for top man who has reached a block in his present position and has capabilities of eventually assuming complete responsibilities. Reply Box No. 905, STEEL, Penton Building, Cleveland 13, Ohio.

Opportunities

Iron Products Manufacturing Company. Established 31 years in southern Wisconsin. Outlets over entire United States. Many patents, products always in demand. Good lease in manufacturing district. Complete modern equipment. Will stand full investigation. Circumstances force sacrifice. John Burch (Heinz Johnson Dunn Affiliate) 2733 Washington St., File 22446, Racine, Wisconsin.

Accounts Wanted

NORTHERN OHIO REPRESENTATION
Executive, Graduate Mechanical Engineer, age 37, would like to represent established manufacturers of industrial fasteners, small stampings or similar production accounts. Write Box 884, STEEL, Penton Bldg., Cleveland 13, Ohio.

KINDRED ACCOUNTS WANTED
Successful Sales Organization in Western New York, warehouse distributors and sales agents of bronze, steel and cast iron products, now desires additional kindred accounts. Our experienced and technical sales force can sell your product in this area. Reply Box 902, STEEL, Penton Building, Cleveland 13, Ohio.

RAILROAD EQUIPMENT—*FOR SALE*

USED **AS IS** **RECONDITIONED**

STANDARD GAUGE FREIGHT CARS

Box, Steel Sheathed, 40-Ton Capacity
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Box, Single Sheathed, 50-Ton Capacity
Flat, 50-Ton, Steel Underframe, 40'6" Long
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Hoppers, Twin, All-Steel, 50-Ton, Cross Dump
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Tank, 3,000-Gallon, High Pressure
Tank, 8,000-Gallon, Coiled and Non-Coiled
Hoppers, All Steel, 70-ton, Triple Hopper Cross Dump

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Eight Wheel, Cupola Type

AUSTIN-WESTERN 30-YARD AIR DUMP CARS; STANDARD GAUGE; 50-TON, SIDE DUMP, DROP DOOR

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"ANYTHING containing IRON or STEEL"

CLASSIFIED

Positions Wanted

SALES ENGINEER REGISTERED PROFESSIONAL DESIRES FACTORY REPRESENTATION OF CAPITAL EQUIPMENT W. PA., N. W. VA., E. OHIO TERRITORIES. ADMINISTRATIVE ENGINEERING AND SALES EXPERIENCE. REPLY P.O. BOX 804, PITTSBURGH.

PLANT OR PRODUCTION MANAGER. Experience covers all phases of plant operation and control, including, costs, methods improvement, incentives and labor relations. M.I.T. graduate. Reply Box 888, STEEL, Penton Bldg., Cleveland 13, Ohio.

Position wanted as drop forge die room foreman 30 years experience in all phases of forge operations including drop, steam, presses, and upsetters. 10 years supervisory experience. Can furnish excellent reference. Reply Box 887, STEEL, Penton Bldg., Cleveland 13, Ohio.

PLANT MANAGER—20 years' experience in Plant Management, Production Control, Manufacturing Development. Could invest. Age 45, married, family. Reply Box 890, STEEL, Penton Building, Cleveland 13, Ohio.

STRUCTURAL SHOP SUPERINTENDENT College man thoroughly experienced in all phases of operation desires similar position in small or medium size shop. Southwest or foreign employment preferred. Reply Box 891, STEEL, Penton Building, Cleveland 13, Ohio.

INDUSTRIAL SALESMAN, 39, Pittsburgh Tri-State District sales twelve years. Wide acquaintance general industrial, steel, coal companies. Also industrial distributors. Engineering background. Desires opportunity $8,000-$10,000. Reply Box 894, STEEL, Penton Building, Cleveland 13, Ohio.

SALES ENGINEER, 34, college graduate, experienced all phases development and sale fabricated nickel alloy products. Reply Box 898, STEEL, Penton Building, Cleveland 13, Ohio.

METALLURGIST: STAINLESS AND ALLOY STEELS—Extensive experience in production, fabrication, research and sales engineering. Outstanding record of achievement. Proven administrator. Now in responsible position desires new connection with progressive company. Reply Box 901, STEEL, Penton Building, Cleveland 13, Ohio.

INDUSTRIAL ENGINEER—Steel. Graduate CHEMICAL ENGINEER. Experience—two years Metallurgical, eleven Industrial. Directed projects in all phases of manufacturing—Methods, Standard Cost, Material Handling, etc. Thoroughly familiar with operations. Reply Box 904, STEEL, Penton Building, Cleveland 13, Ohio.

CALIFORNIA SALES OUTLET

Manufacturers Representative has facilities for one more account. We are now serving Industrial and Aircraft Manufacturers in this area with AAA rating. Reply **Box 903, STEEL, Penton Building, Cleveland 13, Ohio.**

GENERAL SUPERINTENDENT

Drop Forge Company located in Eastern part of country has opening for high grade man who has proven his ability in production methods on board and steam hammers and upsetters, must have thorough knowledge of efficient forging and die shop operation.

MASTER MECHANIC

Also desires capable man thoroughly familiar with general forge shop maintenance both mechanical and electrical on all types of forging equipment.

Give age, experience and salary requirements in reply.

Reply Box 886 STEEL
Penton Bldg. Cleveland 13, Ohio

CRANE DESIGN ENGINEER

Graduate engineer experienced in design and construction wanted to assume charge of engineering department of overhead traveling crane manufacturer. Must have executive ability. Give full details of experience, salary requirements, etc.

Address Box 899
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WE CAN HELP YOU TO CONTACT high calibre men to fill specific jobs you have in mind—
Readers of STEEL include men of wide training and experience in the various branches of the metalworking industry. When you have an opportunity to offer, use the Help Wanted columns of STEEL.

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DI-SAWS, VARIABLE SPEED BAND SAWS, FRICTION SAWING BAND SAWS, SPECIAL SAWING MACHINERY. Write or phone
The TANNEWITZ WORKS
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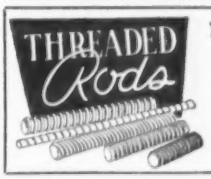
FOR SALE
One Harnischfeger (P&H) Overhead Traveling Crane—5 ton capacity—240 Volt D.C.—36'-10¾" span—Complete with motors and controllers. Available for inspection at our Buffalo, New York plant. Our price $5000 complete with purchaser assuming cost of and responsibility for removing Crane and equipment.
BLISS AND LAUGHLIN, INC., HARVEY, ILLINOIS



10 to 12 ft. lengths
ALL METALS
Also Screw Machine Products to Order
EASTERN
Machine Screw Corp.
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Largest Inventory on Pacific Coast
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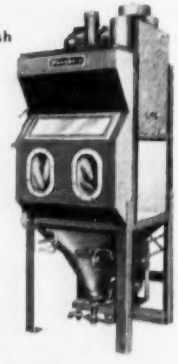
WANTED USED EQUIPMENT IN GOOD CONDITION

1—20 ft x 1" Initial or pyramid type forming roll drop end.
1—10 ft x 3/16" Initial plate forming roll.
2—McCabe Air Flangers ½" or ¾" capacity.
1—20 ft plate edge planer with air or hydro. hold down.
1—Single end punch 30-36" throat ¾" x ¾" punch capacity.
1—50 KVA Air operated spot welder 36" throat.
Require 220-440 60 cycle 3 phase AC motors on all equipment.

Reply Box 895, STEEL
Penton Building Cleveland 13, Ohio

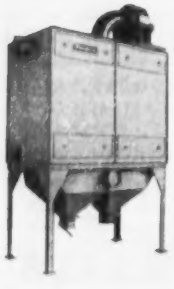
PANGBORN
SPEEDS UP PRODUCTION, LOWERS COST

WITH PRECISION FINISHING . . .



Pangborn Hydro-Finish Cabinet—Removes scale and directional grinding lines . . . holds tolerances to .0001" and prepares surfaces for painting or plating. Liquid blast reduces costly hand cleaning and finishing of molds, dies, tools, etc. Models from . . . **$1410** and up.

AND DUST CONTROL



Pangborn Unit Dust Collector—Traps dust at the source. Machine wear and tear is minimized, housekeeping and maintenance costs reduced. Solves many grinding and polishing nuisances and allows reclamation of valuable material. Models from . . . **$286** and up

Pangborn Blast Cleaning Machines for cleaning tanks, bridges, structures quickly and economically. Portable and stationary models, 6 sizes . . . $188 and up. Cabinet for cleaning small metal parts better and faster . . . $319 and up.

Write for details on these machines to: PANGBORN CORPORATION, 1600 Pangborn Blvd., Hagerstown, Md.

Look to Pangborn for the latest developments in Blast Cleaning and Dust Control equipment

Pangborn

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Advertising Index

Aetna-Standard Engineering Co., The Inside Back Cover
Allegheny Ludlum Steel Corporation 13
Allis-Chalmers Inside Front Cover
American Chain & Cable, American Chain Division 27
American Chemical Paint Co. 137
American Gas Association 22
American MonoRail Co., The 53
American Screw Co. 131
American Welding & Manufacturing Co., The 28
American Zinc, Lead & Smelting Co. 111
American Zinc Sales Co. 111
Armstrong-Blum Manufacturing Co. 31
Atlas Car & Mfg. Co., The 10

Baker-Raulang Co., The 45
Baldwin-Lima-Hamilton, Standard Steel Works Division 24
Barber-Colman Co. 129
Belmont Iron Works, The 136
Bethlehem Steel Co. 1
Bliss & Laughlin, Inc. 141
Bolt & Nut Division, Republic Steel Corporation 121

Carpenter Steel Co., The 127
Charleston Development Board 137
Chemical Corporation, The 5
Chemsteel Construction Co., Inc. 137
Chicago Steel Service Co. 63
Cincinnati Milling Machine Co., The 46
Cincinnati Shaper Co., The 7
Clark Equipment Co., Industrial Truck Division 67
Cleveland Crane & Engineering Co., The, Cleveland Tramrail Division 85, 86
Cleveland Steel Tool Co., The 136
Cleveland Tramrail Division, The Cleveland Crane & Engineering Co. 85, 86
Cold Metal Products Co., The 83
Cowles Tool Co. 134
Crucible Steel Company of America 70

Detroit Steel Corporation, Reliance Steel Division 32
Drave Corporation, Heating Department 134
Dulien Steel Products, Inc. 141

Eastern Machine Screw Corporation, The 134, 141
Electric Controller & Mfg. Co., The 76

Gates Rubber Co., The 8
Gisholt Machine Co. 17, 18, 19, 20
Gordon, Claud S., Co. 6
Great Lakes Steel Corporation 50

Hamilton Tool Co., The 25
Heald Machine Co., The 2
Heppenstall Co. 58
Horsburgh & Scott Co., The 122
Hubbard, M. D., Spring Co. 136

Inland Steel Co. 36
Insul-Mastic Corporation of America 9
Iron & Steel Products, Inc. 141

Jones & Laughlin Steel Corporation 99

Kenilworth Steel Co., The 57
Kennametal, Inc. 125

L & J Press Corporation 130
Lee Rubber & Tire Corporation, Republic Rubber Division 4
Leschen Wire Rope Division, The Watson-Stillman Co. 97
Lindberg Engineering Co. 75
Lindberg Steel Treating Co. 117
Luria Brothers & Co., Inc. 139

Metzgar Conveyor Co. 134

National Steel Corporation 50
Newport Steel Corporation 106

Ohio Locomotive Crane Co., The 136
Orton Crane & Shovel Co. 12
Osborn Manufacturing Co., The 3
Ottawa Steel Products, Inc. 137

Pangborn Corporation 142
Platecoil Division, Tranter Manufacturing, Inc. 123

Reading Crane & Hoist Corporation 128
Ready-Power Co., The 94
Reliance Electric & Engineering Co. 26
Reliance Steel Division, Detroit Steel Corporation 32
Republic Rubber Division, Lee Rubber & Tire Corporation 4
Republic Steel Corporation 23
Republic Steel Corporation, Bolt & Nut Division 121
Robbins & Myers, Inc. 21
Roebling's, John A., Sons Corporation 69
Russell, Burdsall & Ward Bolt & Nut Co. 14, 15
Ryerson, Joseph T., & Son, Inc. 35

Sharon Steel Corporation 54
Simonds Gear & Mfg. Co., The 16
Special Engineering Service, Inc. 126
Square D Co. 11
Standard Steel Works Division, Baldwin-Lima-Hamilton 24
Sun Oil Co. 61

Tannewitz Works, The 141
Thomas Flexible Coupling Co. 104
Timken Roller Bearing Co., The Back Cover
Toledo Steel Roll Co. 135
Tranter Manufacturing, Inc., Platecoil Division 123

United Engineering & Foundry Co. 105
United States Steel Corp., Subsidiaries 92
United States Steel Supply Division, United States Steel Corporation 92

Ward Steel Co. 135
Watson-Stillman Co., The, Leschen Wire Rope Division 97
Webb Corporation, The 103
Wheeling Steel Corporation 136

~ ~ ~

Table of Contents, Page 5

Classified Advertising, Pages 140, 141

GOOD EQUIPMENT BRINGS DOWN PRODUCTION COSTS

continuous

buttweld pipe mills

The expansion of the steel industry has been marked by great demand for Continuous Butt Weld Pipe Mills from Aetna-Standard. Recent installations include two mills in the new Fairless Works for ½" to 4" and one mill for Sharon Tube for ⅛" to ¾" sizes.

Most of the Continuous Butt Weld Pipe Mills around the world carry the name of Aetna-Standard. Aetna designs, engineers and builds the mills complete from coil storage through shipping department . . . and supervises installation.

THE AETNA-STANDARD ENGINEERING COMPANY • PITTSBURGH, PA.

Aetna-Standard

PLANTS IN WARREN, OHIO • ELLWOOD CITY, PENNSYLVANIA

ASSOCIATED COMPANIES

Head Wrightson Machine Company, Ltd., Middlesbrough, England — Great Britain, Finland, Sweden, Norway, Denmark, Union of South Africa, Northern and Southern Rhodesia.

Aetna-Standard Engineering Company, Ltd., Toronto, Ontario, Canada.

M. Castellví Inc., New York, N. Y. — Mexico, Central and South America.

Societe de Constructions de Meerbard, Paris, France — France, Belgium, Holland, Luxembourg, Switzerland.

Demag Aktiengesellschaft, Duisburg, Germany — Germany, Austria, Yugoslavia, Greece, Turkey, Egypt.

Compagnia Italiana Forme Acciaio, Milano, Italy — Italy.

Aetna-Japan Company, Ltd., Tokyo, Japan — Japan.

Hale & Kullgren, Inc., Akron, Ohio — Representative for the Rubber Industry.

Designers and Builders to the Ferrous, Non-Ferrous, Leather and Rubber Industries

How TIMKEN® bearings as back-up rolls keep levellers from marking sheets

WITH Timken® bearings as back-up rolls, levellers flatten sheets without marking, give long, trouble-free performance. Because Timken bearings practically eliminate friction, they easily accelerate to top speeds. As a result, skidding and scuffing between work roll and back-up roll is reduced. This helps eliminate marking of the sheets. And because these bearings are both anti-friction bearings and back-up rolls, design is greatly simplified.

The OD of the outer race of each Timken bearing is the surface that contacts and supports the work roll. Because of the extremely smooth surface finish of the OD of these bearings, the work rolls are not marked with the result that the sheets are also unmarked.

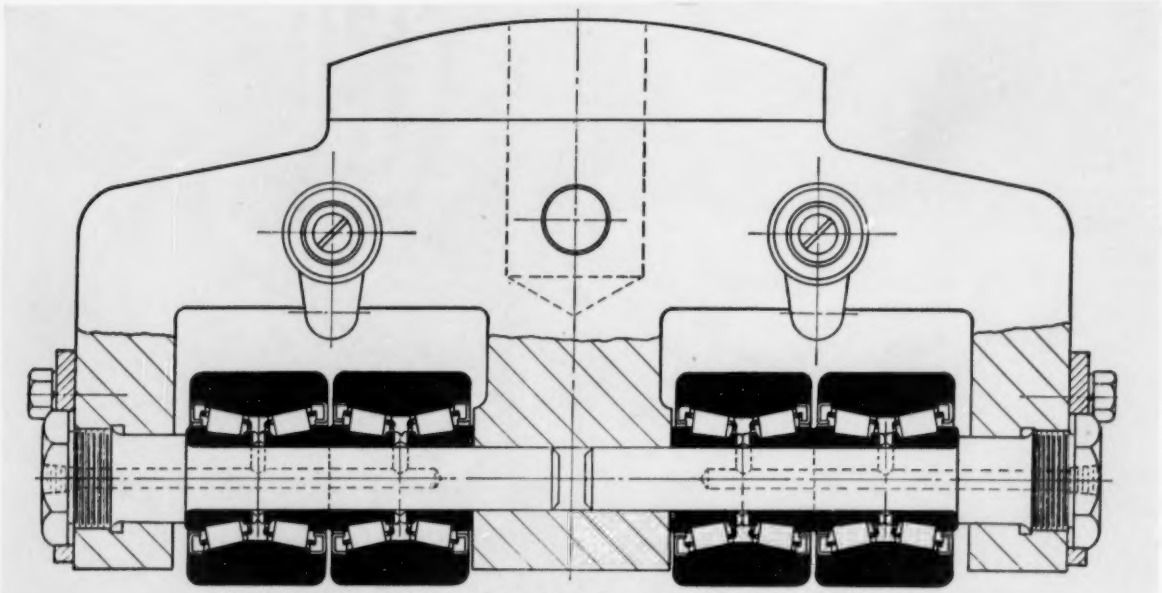
By keeping housings and shafts concentric, Timken bearings make closures more effective; lubricant is kept in, dirt kept out. As a result, maintenance is minimized.

Finally, Timken bearings are able to take the tremendous radial loads set up by this operation. Line contact between the rollers and races gives them the load carrying capacity to take these loads with ease. Tapered construction allows Timken bearings to carry both radial and thrust loads in any combination. Deflection and end-movement of shafts and rolls is eliminated.

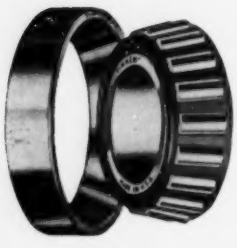
Timken bearings are now used on practically all makes of levellers.

Always specify Timken bearings for the machines you build or buy. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



Mounting diagram shows how Timken bearings are used as back-up rolls in levellers.



TIMKEN

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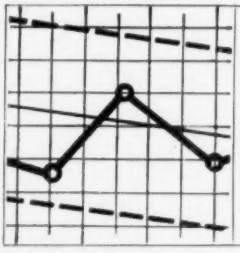
TAPERED ROLLER BEARINGS



STATISTICAL QUALITY CONTROL

To insure uniform high quality and closer tolerances, the Timken Company uses statistical quality control. With it, tolerance deviations are plotted graphically. It's one of industry's newest, most scientific methods of improving product uniformity.

NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION